

DRAFT GENERAL MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT

UPPER ST. CROIX AND NAMEKAGON RIVERS



SAINT CROIX
NATIONAL SCENIC RIVERWAY
Wisconsin • Minnesota



Printed on recycled paper


DRAFT GENERAL MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT

UPPER ST. CROIX AND NAMEKAGON RIVERS

NOVEMBER 1997

ST. CROIX NATIONAL SCENIC RIVERWAY

United States Department of the Interior • National Park Service • Denver Service Center



Digitized by the Internet Archive
in 2012 with funding from
LYRASIS Members and Sloan Foundation

<http://archive.org/details/draftgeneralmana97nati>

SUMMARY

In 1968 Congress designated the Upper St. Croix and Namekagon Rivers as one of the nation's first wild and scenic rivers. Attributes leading to this designation included the area's outstanding scenic and recreational values and its largely primitive and mostly undeveloped shorelines and watersheds. (The Lower St. Croix, below Taylors Falls dam, was also designated as a scenic river in 1972.) Although both the upper and lower riverways are administered and managed as a single unit, this general management plan addresses only the upper riverway. A separate management plan is being prepared for the lower riverway.

In 1976 a *Master Plan* was approved for the Upper St. Croix riverway. This plan was appropriate for starting up the riverway, with its focus being land acquisition and the provision of adequate visitor facilities. The foundation that the *Master Plan* laid for the riverway now needs to be updated to prepare for changes that have occurred — to take a new look at the management of the riverway, to address problems and opportunities that were not apparent 21 years ago, and to focus riverway management on current long-term management goals.

To accomplish this the National Park Service is preparing this *Draft General Management Plan / Environmental Assessment* for the Upper St. Croix and Namekagon Rivers in Minnesota and Wisconsin. The purpose of this plan is to describe the general direction that the National Park Service intends to follow in managing the upper riverway for the next 15 to 20 years while meeting the stated purposes of the upper riverway as set forth in the Wild and Scenic Rivers Act.

The general management plan process is a multiagency endeavor that provides opportunities for public comment. The plan includes a range of alternatives for managing the riverway, as well as an assessment of the

potential environmental impacts of implementing each alternative. A no-action alternative (a continuation of management under the 1976 *Master Plan*) is also provided as a basis of comparison. The preferred plan would provide a framework for proactive decision making, including decisions on visitor use, natural and cultural resource management, and general development.

THE ALTERNATIVES

ALTERNATIVE 1: THE PREFERRED ALTERNATIVE

The National Park Service would strive to maintain and restore riverway resources while still providing opportunities for low-impact visitor activities. A variety of experiences, particularly solitude, quiet, and naturalness, would continue to be found.

Most recreational facilities and use levels and patterns would continue to be maintained as they are; some facilities might be modified to improve resource quality or visitor experiences or to address other management concerns. The only new facilities that would be allowed would be primitive and/or developed campsites (and the already approved relocation of the Trego visitor center and the correction of the foundation problems at the riverway headquarters).

Proactive management would include establishing objectives, standards, and indicators for resource conditions, as well as for the type and quality of visitor experiences desired along specific stretches of the riverway. Through monitoring those standards, and indicators, the National Park Service would help ensure the future preservation of the riverway, as envisioned under this alternative.

Canoeing, inner tubing, fishing, hunting, and motorboating, would continue as long as unacceptable user conflicts and resource impacts did not occur. To resolve user conflicts and/or eliminate resource impacts, management actions such as encouraging use at different times or placing restrictions on visitor use would be implemented if necessary.

The most significant impact of implementing alternative 1 would be that the existing mostly natural character of the riverway would be preserved over time. If visitor use demands were to increase in the future, restrictions on visitor use might be necessary to help preserve the riverway's outstanding resource values and its mostly natural character.

ALTERNATIVE 2: ALLOW INCREASED USE

The National Park Service would allow expanded recreational opportunities on specific reaches of the riverway while maintaining riverway resources. The existing visitor experience would probably change in some areas along the riverway, particularly from Hayward to Trego and Riverside to river mile 55, which could receive higher volumes of use. Any expansion of recreational opportunities and/or any increases in visitor use would be in line with visitor demand; riverway resource conditions would determine limits on how much use could occur in given areas. Exceptional resource values would still be protected, consistent with the upper riverway purposes and significance.

As in alternative 1, proactive management would include establishing objectives, standards, and indicators for resource conditions, as well as for the type and quality of visitor experiences desired along specific stretches of the riverway. Through monitoring those standards, and indicators, the National Park Service would help ensure the future preservation of the riverway, as envisioned under this alternative.

Canoeing, inner tubing, fishing, hunting, and motorboating, would continue as long as unacceptable user conflicts and resource impacts did not occur. To resolve user conflicts and/or eliminate resource impacts, management actions such as encouraging use at different times or placing restrictions on visitor use would be implemented if necessary.

Monitoring activities would be increased to ensure that exceptional resource values would not be degraded as a result of increased use.

Most NPS facilities would remain; however, if use increases, additional recreational facilities might be provided. (As in each alternative, the already approved relocation of the Trego visitor center and the correction of the foundation problems at the riverway headquarters would be addressed). Careful site selection for new access points and parking could disperse use and preserve as much feeling of solitude as possible.

The most significant impact if implementing alternative 2 would be the potential for a greater diversity and number of recreational opportunities along the riverway. However, allowing greater numbers of visitors and uses might result in some loss of the riverway's mostly natural character, as well as some opportunities for solitude.

ALTERNATIVE 3: CONTINUE MANAGEMENT UNDER THE 1976 MASTER PLAN (NO ACTION)

This alternative is included to satisfy the requirements of the National Environmental Policy Act and to provide a baseline for comparing the other alternatives. The National Park Service would continue to manage the riverway as it has in the past, providing developments and services for riverway visitors, and relying on the 1976 *Master Plan* for guidance and direction. Canoeing, fishing, hunting, and other nonmotorized activities, as well as motorboat use, would be permitted throughout the riverway. Under the no-action alternative, natural resource management

would continue to focus on responding to external pressures (e.g., water pollution), conducting baseline inventories, monitoring resources, and controlling exotics to the extent possible given limited personnel and funding.

Permitted uses of the riverway might evolve, and no new management actions would be taken to regulate or control uses unless it was determined that they were adversely affecting the upper riverway's exceptional values. Campsites, trails, interpretive facilities, access points, and other recreational facilities generally would not change, but some might be expanded if use increases. NPS visitor facilities might also be closed or relocated to address resource impacts. (As in the other alternatives, the already approved relocation of the Trego visitor center and the correction of the foundation problems at the riverway headquarters would be addressed).

The most significant impacts of implementing alternative 3 would be similar to those described for alternative 2 — allowing greater numbers of visitors and uses could result in some loss of the riverway's mostly natural character, as well as some opportunities for solitude. Additionally, under this alternative there would be fewer management tools

to accommodate future demands for increased use and to prevent or quickly respond to future adverse impacts on riverway resources.

WHAT IS NEXT?

The public review and comment period for this draft document will be 45 days. Comments on the draft plan will be analyzed, and appropriate changes will be made to the document in response. Various elements of the preferred alternative and other alternatives might be modified to address comments. Assuming no significant impacts become apparent during the public review period, a *Final General Management Plan* and "Finding of No Significant Impact" will then be issued.

Comments, or questions about this draft plan should be sent to the following address:

Superintendent
St. Croix National Scenic Riverway
401 Hamilton Street
P.O. Box 708
St. Croix Falls, WI 54024-0708
(715) 483-3284

CONTENTS

Introduction	1
Brief Description of the Upper Riverway	1
Purpose of and Need for the General Management Plan	1
The Planning Process	2
Planning Issues and Concerns	5
Water Quality Degradation from Adjacent Developments	6
Degradation of Natural Scenic Quality	6
Increasing Visitor Numbers	6
The Growth of Outfitting	6
Conflicting Recreational Uses	7
The Lack of Information on Natural and Cultural Resources	7
Inadequate Staffing of the Upper Riverway	7
Relationship of Other Planning Efforts to This Management Plan	7
What is Next in the Process?	9
ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE	11
Introduction	13
Significance and Purposes of the Upper St. Croix National Scenic Riverway	13
Significance	14
Purposes	14
Actions Common to All Alternatives	15
Cooperation with State Parks and Forests	15
Coordination with Agencies and Organizations	15
Native American Relationships	15
Natural Resource Management	15
Water Quality	16
Threatened and Endangered Species	16
Vegetation Management	17
Wildlife Management	17
Fisheries Management	18
Exotic Species	18
Sand and Gravel Mining	18
Preservation of Natural Scenic Values	18
River Crossings	19
Cultural Resource Management	19
Visitor Use Management and Safety	19
Visitor Use	19
Visitor Safety	20
Fees	20
Accessibility for Individuals with Disabilities	20
Interpretation	21
Outfitters and Concession Operations	21
Land Protection Actions	22

Future Plans and Research Required	22
Management Areas	25
Near-Primitive Northwoods Area	25
Northwoods Recreation Area	25
Developed Recreation Area	26
Urban Recreation Area	26
The Management Alternatives	29
Alternative 1: The Preferred Alternative	29
Concept	29
Management Areas	29
Managing Riverway Visitor Capacity	30
Riverway Administration and Staffing	32
Alternative 2: Allow Increased Use	32
Concept	32
Management Areas	34
Managing Riverway Visitor Capacity	34
Riverway Administration and Staffing	35
Alternative 3: Continue Management under the 1976 Master Plan (No Action)	36
Concept	36
Management Areas	36
Managing Riverway Visitor Capacity	36
Riverway Administration and Staffing	36
Alternatives Considered But Not Analyzed Further	38

AFFECTED ENVIRONMENT 39

The St. Croix Riverway and Its Environs	41
Natural Scenic Resources and Visitor Experiences	41
Lake Namekagon to Highway 63 (Cable Wayside)	41
Highway 63 (Cable Wayside) to Hayward	41
Hayward Flowage (Airport Road to Trailer Park Road)	41
Hayward to Trego	42
Trego Flowage (Railroad Bridge to NSP Dam)	42
Trego to Riverside, Including the St. Croix up to the CCC Bridge	42
Gordon Dam to CCC Bridge	42
Riverside to Rapids	43
Rapids	43
Rapids to Upper Taylors Falls Flowage (Nevers Dam Site)	43
Upper Taylors Falls Flowage (Nevers Dam Site to River Mile 55)	44
Lower Taylors Falls Flowage (River Mile 55 to Taylors Falls Dam)	44
Land and Water Status	44
NPS Fee Title (about 20,850 Acres)	57
Private Ownership with NPS Scenic / Riverfront Easement (about 10,216 Acres)	57

Other Public Ownership (about 31,533 Acres)	57
Private Ownership, Acquisition Deferred (about 3,582 Acres)	57
Private Ownership, Protection Program Not Complete (about 1,682 Acres)	58
Rights-of-way and Other Types of Easement Interests (No Specific Acreage Assigned)	58
Jurisdiction	58
The Watershed	58
Natural Resources	59
Climate	59
Air Quality	59
Noise	59
Physiography and Topography	60
Geology	61
Area Geologic Formation	61
Minerals	62
Soils	62
Prime and Unique Agricultural Soils	63
Water Resources	63
Water Quality	64
Groundwater	67
Floodplains and Wetlands	67
Biological Resources	69
Vegetation	69
Wildlife	72
Threatened and Endangered Species	76
Cultural Resources	80
Historical Overview	80
Physical Resources	81
Archeological Resources	81
Historic Resources	82
Cultural Landscapes	82
Traditional Cultural Properties	82
Riverway Administration and Regional Facilities	83
Riverway Staffing	83
District Administration	83
Existing Upper Riverway Facilities	83
Other Recreational Facilities Within or Directly Adjacent to the Upper St. Croix	
National Scenic Riverway	85
Chequamegon National Forest — U.S. Forest Service	85
Gordon Dam Park — Douglas County, Wisconsin	85
St. Croix State Forest — Minnesota Department of Natural Resources	85
St. Croix State Park — Minnesota Department of Natural Resources	88
Chengwatana State Forest — Minnesota Department of Natural Resources	88
Governor Knowles State Forest — Wisconsin Department of Natural Resources	88
St. Croix Wild River State Park — Minnesota Department of Natural Resources	88
Regional Recreational Activities and Facilities	88

CONTENTS

Visitor Use 91

Visitor Experiences and Interpretive Programs 91

Existing Visitor Use and Patterns 92

Month-by-Month Data and Analysis 94

Overnight Use 94

Visitor Use Profile 96

Principal Kinds of Activities 96

Projections of Potential Visitor Use 97

Socioeconomic Environment 100

Regional Setting and Land Use Characteristics 100

Visitor Services 100

Population 100

Economy 102

Transportation / Access 104

ENVIRONMENTAL CONSEQUENCES 105

Introduction 107

Impacts on Natural Scenic Resources 108

Impacts on Natural Resources 110

Air Quality 110

Noise 110

Water Resources 110

Floodplains and Wetlands 111

Soils 112

Vegetation 112

Wildlife 114

Threatened and Endangered Species 115

Impacts on Cultural Resources 117

Impacts on the Visitor Experience 119

Impacts on the Socioeconomic Environment 121

Cumulative Effects 122

Natural Scenic Resources 123

Natural Resources 123

Cultural Resources 124

Visitor Experience 124

Socioeconomic Environment 125

Compliance 129

Consultation and Coordination 135

APPENDIXES / BIBLIOGRAPHY / PREPARERS 139

Appendixes

- A: Legislation 141
- B: Desired Future Conditions for the Upper Riverway 158
- C: Upper St. Croix Management Commission Policy Resolution 160
- D: Summary of Natural Resources Management Actions 168
- E: More Detail on the VERP Process 170
- F: St. Croix National Scenic Riverway Proposed Increased Staffing 171
- G: Letter from U.S. Fish and Wildlife Service 173

Bibliography 181

Preparers and Consultants 184

TABLES

- 1: Summary of the Management Area Characteristics 28
- 2: Summary of the Key Differences between the Alternatives 37
- 3: EPA Water Quality Criteria Exceedances 65
- 4: Discharge Rates in Cubic Feet Per Second for the 100-year and 500-year Floods on the Upper St. Croix and Namekagon Rivers 68
- 5: Threatened and Endangered Species 77
- 6: Upper St. Croix National Scenic Riverway Roads, Trails, Bridges, and Parking Lots 86
- 7: Upper St. Croix National Scenic Riverway Picnic Areas, Campgrounds, and Launch Ramps 86
- 8: Upper and Lower St. Croix National Scenic Riverway Total Annual Visitation 1982–95 93
- 9: Upper and Lower St. Croix National Scenic Riverway Annual Visitation 1993–96 93
- 10: Upper and Lower St. Croix National Scenic Riverway, Total Backcountry Camping (Overnight Stays) 1982–96 95
- 11: Namekagon and Marshland Districts Backcountry Camping (Overnight Stays) for 1996 by Month 96
- 12: Namekagon and Marshland Districts Average Length-of-Stay by Category 97
- 13: Namekagon and Marshland Districts Potential Recreational Use 1996–2006 99
- 14: St. Croix National Scenic Riverway Population Data and Percentage Change for Selected Years 101
- 15: St. Croix National Scenic River Top Three Industries in 1994 in Terms of Earnings 102
- 16: St. Croix National Scenic River Per Capita Income for Selected Years 103
- 17: St. Croix National Scenic River Unemployment and Poverty (1990 Census) 104
- 18: Summary of Impacts 126

FIGURES

- A: Upper and Lower St. Croix National Scenic Riverway, Annual Recreation Visits 1993–1996 94
- B: Namekagon and Marshland Districts, Recreational Use by Month for 1996 95
- C: Namekagon and Marshland Districts, Actual and Projected Visitor Use 1993–2007 99

MAPS

Region	3
Vicinity	4
Management Areas: Alternative 1 — Preferred Alternative	31
Management Areas: Alternative 2	33
Landownership: Sheet 1 of 6	45
Landownership: Sheet 2 of 6	47
Landownership: Sheet 3 of 6	49
Landownership: Sheet 4 of 6	51
Landownership: Sheet 5 of 6	53
Landownership: Sheet 6 of 6	55
District Administration	84
Recreational Opportunities	87

INTRODUCTION

BRIEF DESCRIPTION OF THE UPPER RIVERWAY

In 1968 Congress designated the Upper St. Croix River and its major tributary, the Namekagon, as one of the first wild and scenic rivers when it enacted the Wild and Scenic Rivers Act (Public Law 90-542, see appendix A). The Lower St. Croix, below Taylors Falls dam, was subsequently designated as a scenic river in 1972 (see Region and Vicinity maps). Both the upper and lower riverway are administered and managed as a single unit; however, this plan addresses only the upper riverway.

The boundary of the upper riverway includes a portion of the St. Croix River and the entire length of the Namekagon for a total of about 200 river miles. The St. Croix flows 154 miles from its headwaters near Solon Springs, Wisconsin, to Prescott, Wisconsin, where it joins the Mississippi River. About 102 miles of the St. Croix above Taylors Falls dam are within the boundaries of the upper riverway. The Namekagon River runs for about 98 miles from Lake Namekagon to its confluence with the St. Croix.

Although it is relatively close to the Twin Cities metropolitan area, the upper riverway corridor has a relatively natural appearance for much of its length, the major exceptions being the towns of Hayward, Trego, and St. Croix Falls / Taylors Falls. The rivers are mostly free flowing, but at four areas dams form lake-like stretches called flowages. The St. Croix and Namekagon pass through various landscapes — from a narrow meandering stream closed in by dense forests to areas that provide expansive views of a wide river valley. The riverway includes diverse biological communities. The riverway's scenery, plentiful fish and wildlife, largely unpolluted and free-flowing character, relatively safe class I rapids, plentiful access points, and closeness to the Twin Cities attract many visitors in the late spring, summer, and fall. Visitors enjoy

canoeing, camping, picnicking, fishing, hunting, inner tubing, and motorboating on the riverway.

The authorized boundary for the Upper St. Croix National Scenic Riverway encompasses 67,653 acres. The National Park Service (NPS) manages a portion of these lands under fee simple ownership or as riverfront and scenic easements. However, much land in the riverway boundary is not in federal ownership or under NPS management. Wisconsin and Minnesota state parks, state forests, wildlife management areas, and county forests are in or near the riverway boundary. The U.S. Forest Service manages land on the upper reach of the Namekagon River as part of the Chequamegon National Forest. A portion of the reservation of the St. Croix Chippewa Indians of Wisconsin is within the boundary. Several privately owned lands are also in the riverway boundary, with Northern States Power Company (NSP) being the largest landowner (see the "Land and Water Status" section in the "Affected Environment").

PURPOSE OF AND NEED FOR THE GENERAL MANAGEMENT PLAN

In 1976 the National Park Service approved a *Master Plan* for the Upper St. Croix Riverway. This plan was appropriate for starting up the riverway, with its focus on acquiring land and providing adequate visitor facilities. The foundation that the *Master Plan* laid for the riverway now needs to be updated to prepare for changes that have occurred — to take a new look at the management of the riverway, to address problems and opportunities that were not apparent 21 years ago, and to focus riverway management on current long-term management goals.

The National Park Service is preparing this *Draft General Management Plan / Environmental Assessment* for the Upper St. Croix and Namekagon Rivers in Minnesota and Wisconsin. The purpose of this plan is to describe the

general direction the National Park Service intends to follow in managing the upper riverway for the next 15 to 20 years while meeting the stated purposes of the upper riverway. The general management planning process is a multiagency endeavor that provides opportunities for public comment.

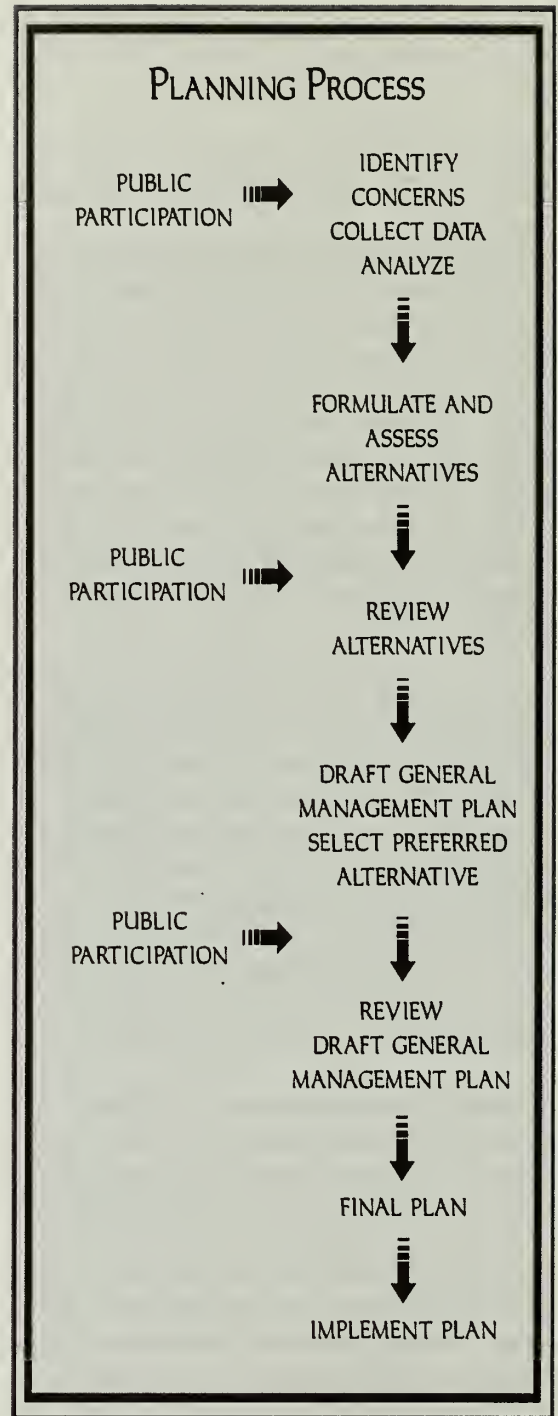
This plan includes a range of alternatives for managing the riverway, as well as an assessment of the potential environmental impacts of implementing each alternative. A no-action alternative (a continuation of management under the 1976 *Master Plan*) is provided as part of the range of alternatives and serves a basis of comparison. The preferred plan would provide a framework for proactive decision making, including decisions on visitor use, natural and cultural resource management, and general development.

This plan takes the long view, which may be many years into the future, when dealing with time frames of natural and cultural processes. It considers the riverway holistically, in its full ecological and cultural contexts — as a unit of the national park system and as a part of a surrounding region. The reason general management plans are prepared is to clearly define a park's mission (purpose and significance), its mission goals, and its management direction, as well as to serve as the foundation to guide and coordinate all subsequent management decision making. These components are key to this plan's longevity because it is unlikely that they will change over the life of this plan.

This general management plan will serve as a management tool to guide decision making over the long term; it will not provide specific and detailed answers to every issue or question. However, the plan will provide a management framework that will allow riverway managers to effectively address future problems.

THE PLANNING PROCESS

Planning began for the upper riverway in the winter of 1994–95. The planning team consisted of staff from the National Park Service,



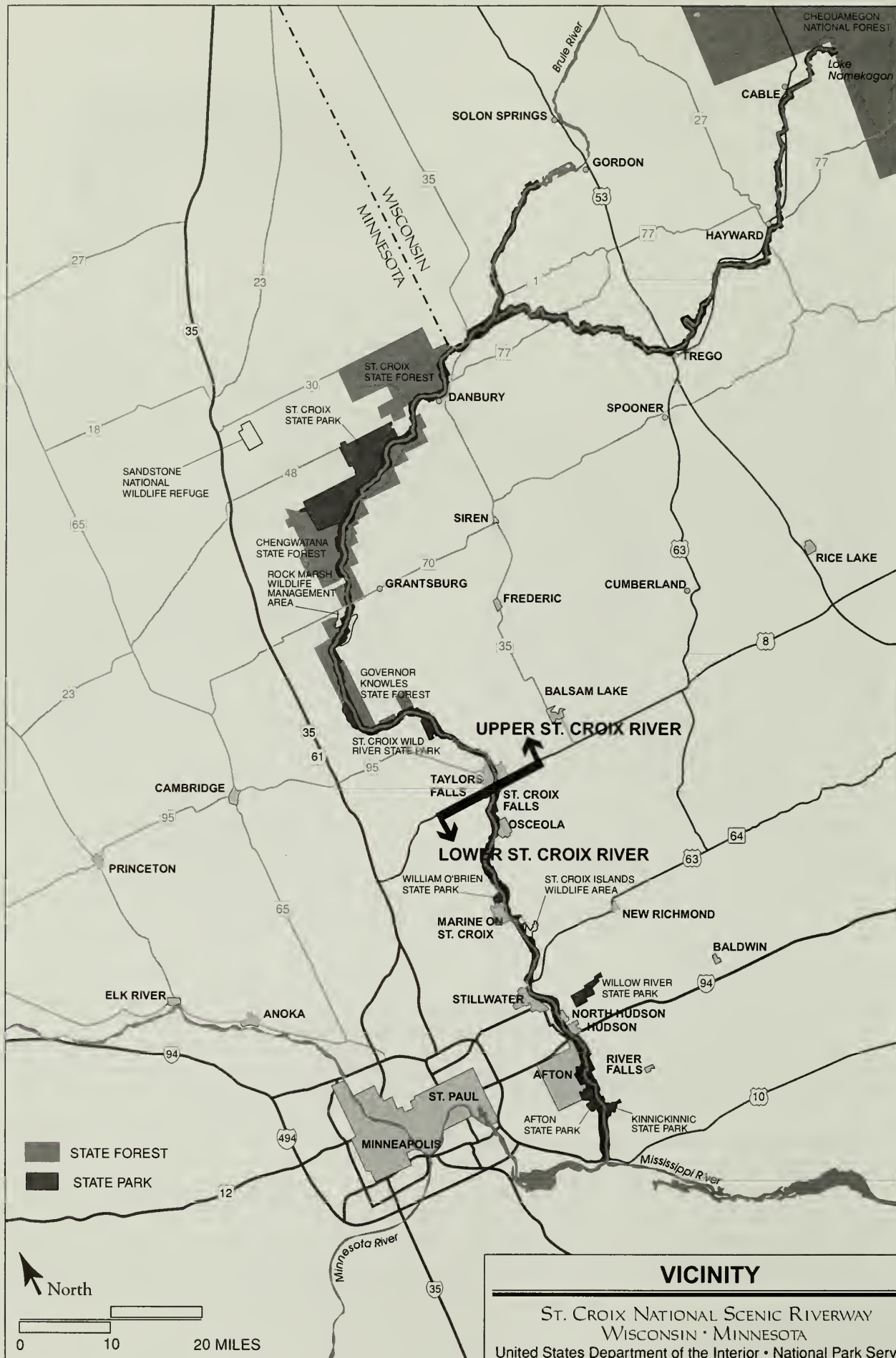
representatives of the Minnesota and Wisconsin Departments of Natural Resources (MNDNR and WIDNR), and representatives of the Upper St. Croix Management Commission. (The commission is a cooperative endeavor among Northern States Power Company, the states of



REGION

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA

United States Department of the Interior • National Park Service
DSC • 630 • 20021 • 9/96



Minnesota and Wisconsin, the National Park Service, and the Minnesota–Wisconsin Boundary Area Commission, who are all concerned with the management of the riverway corridor and adjoining lands.) Informal consultation with the U.S. Fish and Wildlife Service was conducted early in this process, and contact was also maintained with the Minnesota and Wisconsin state historic preservation officers, the St. Croix Chippewa Indians of Wisconsin, and the Great Lakes Indian Fish and Wildlife Commission. (For others who were consulted during the planning process, see the “Preparers and Consultants” section.)

The first major step in the planning process was to collect data and identify the planning context for the upper riverway. The planning team identified the significance and purposes of the upper riverway, gathered and analyzed information, determined issues and concerns that needed to be addressed in the plan, identified planning mandates and constraints, and examined possible visions and desired future conditions for the upper riverway. (Regarding the desired future conditions for the upper riverway, see appendix B).

The next major step was to develop a range of reasonable alternatives for managing the upper riverway, resolving problems, and achieving the desired future conditions. After analyzing the environmental consequences and implications of each alternative, and after considering public input on these preliminary alternatives, the planning team recommended a preferred alternative. The team then prepared and distributed this *Draft General Management Plan / Environmental Assessment* for public comment, which contains the range of alternatives and the preferred alternative.

Because of the complex makeup of the riverway, which traverses or abuts state parks, state and county forests, municipalities, townships, and tribal lands, and the diverse publics interested in the future of the riverway, public involvement was an important aspect throughout the planning process. Opportunities were provided to the public to share their views on the upper river-

way’s purposes and significance, desired future conditions, issues and concerns, and preliminary management alternatives. The planning team primarily relied on newsletters and workbooks to communicate with the public. A mailing list with about 800 names of individuals and groups was developed during the course of the project. Newsletters were mailed out in April and November 1995, and an alternatives workbook was mailed in March 1996. Mailback response forms provided feedback from the public. Open houses were held in November 1996 and January 1997 to obtain public input on the draft preferred alternative. (See the “Consultation and Coordination” section for more information about public involvement to date.)

After considering public comments and other information on this *Draft General Management Plan / Environmental Assessment*, a determination will be made on whether the plan would result in significant impacts. If significant impacts become apparent during the public review period, the National Park Service would then issue a notice of intent to prepare an environmental impact statement, as required under the National Environmental Policy Act. If no significant impacts are identified, this draft will be revised as needed and a *Final General Management Plan / “Finding of No Significant Impact”* will be prepared and distributed. The National Park Service will then implement the plan when funding becomes available.

PLANNING ISSUES AND CONCERNS

The public, riverway staff, and planning team identified a number of issues and concerns facing the Upper St. Croix National Scenic Riverway, some of which can be addressed in this plan and some of which are beyond the scope of this plan. The issues and concerns generally fall into one of three categories: potential for degradation of the visitor experience; potential for impacts on natural and cultural resources in the riverway; and potential for impacts on the visual quality of the riverway.

Seven major issues and concerns are being addressed by this *General Management Plan*. The plan sets up a management framework that provides general guidance for addressing all of these issues and concerns. However, in many cases future research will be required to fully implement long-term solutions. The issues and concerns are as follows.

WATER QUALITY DEGRADATION FROM ADJACENT DEVELOPMENTS

The upper riverway's water quality today is generally considered to be high. However, there are concerns about pollution entering the riverway from external sources. Runoff from agricultural lands, roads, urban areas, and logging operations, as well as groundwater contamination from septic systems and discharges from wastewater treatment facilities, are all potential pollution sources that could be affecting the upper riverway's tributaries. Several organic compounds have been detected in fish on the St. Croix and Namekagon; the source of the compounds is unknown. As the population and developments continue to increase near the riverway and its tributaries, the potential for degradation of the rivers' water quality will increase. For planning efforts related to water quality, please see "Relationship of Other Planning Efforts to this Management Plan" section.

DEGRADATION OF NATURAL SCENIC QUALITY

There are many concerns regarding the scenery visitors will see along the riverway in the future. Although most of the land within the riverway boundary is public land, not all of it is under NPS management (NPS fee lands) or subject to riverfront or scenic easements. Development in communities along the riverway (e.g., Hayward, Trego, Danbury, Taylors Falls, and St. Croix Falls) could affect the riverway's natural scenic quality. A lack of comprehensive zoning in several of these communities increases the likelihood of such development occurring. Also,

proposals may be made to expand or build new river crossings for utilities or roads. Sand and gravel operations and logging on federal, state, and county forest lands and on properties with easements may be visible from the riverway. Other land use changes outside the riverway may also be visible from the riverway (e.g., new residential or commercial developments, communication antennas, and power transmission lines).

INCREASING VISITOR NUMBERS

Currently, the volume of visitor use is not believed to be resulting in significant unacceptable impacts on resources or visitors on the upper riverway. However, use levels could increase to unacceptable levels within 10 years (see table 9 in the "Affected Environment"). If visitor numbers increase by this amount, impacts on riverway resources and on the quality of visitor experiences will be likely. Visitor use already is believed to be resulting in increased erosion and vegetation loss at landings, campsites, and popular day use areas. If visitor use continues to increase, this will likely result in other resource impacts, such as affecting the visual appearance of localized areas, compacting soil, cutting trees at campsites, and depositing wastes that affect the rivers' water quality in localized areas. A continued increase in the numbers of canoeists, inner tubers, and motorboaters also will likely degrade the experience of some visitors: with more users, noise levels would likely increase, there would be more competition for campsites, and opportunities to find solitude and quiet would be much more limited.

THE GROWTH OF OUTFITTING

The number of canoers using outfitters appears to be increasing. The outfitting business provides canoes, supplies, and transportation services to clients. Several outfitters have started renting inner tubes in recent years. The National Park Service currently does not regulate any commercial activities on the river. Concerns have been expressed that expanding outfitting

operations could increase significantly the number of people using portions of the riverway in the near future. Inner tubing appears to have increased significantly on the Namekagon River (especially in the segment from Earl Park to Trego) and has expanded to other segments of the river (notably from Stinnett to Groat Landing). This could adversely impact the natural resources and visitor experiences on the riverway.

CONFLICTING RECREATIONAL USES

Different user groups seek different experiences and conditions on the upper riverway. Sometimes these experiences and desired conditions conflict. For example, individuals seeking quiet and solitude may object to motorboats (particularly if they are traveling at high speed) or loud groups of inner tubers or canoers. Although conflicts occur now between user groups, they are not common, mostly because the rivers' physical qualities sort out where different activities occur. However, there is potential for future conflicts in the flowages where different uses could occur at the same time. Concerns also have been raised about the use of personal watercraft (such as jet skis) and motorboats with larger engines, which could pose a safety hazard and impact the experiences of other visitors.

THE LACK OF INFORMATION ON NATURAL AND CULTURAL RESOURCES

The resources of the upper riverway have not been completely inventoried and evaluated. Baseline data is lacking on the upper riverway's biotic communities, vegetation, reptiles and amphibians, and the distribution of riparian mammals. Most of the riverway's natural resources are not being monitored. A basic cultural resources inventory, including a list of structures that may be eligible for listing on the National Register of Historic Places and a cultural landscape inventory, has not yet been completed, although studies are underway. Without this basic natural and cultural resource information, the National Park Service cannot be fully aware of significant resources in the river-

way, impacts that are occurring on those resources, and what management strategies need to be taken to maintain and protect the riverway's resources.

INADEQUATE STAFFING OF THE UPPER RIVERWAY

In 1997 the riverway had 23 permanent positions and 26 part-time or seasonal positions, which were either management or field operation positions (e.g., visitor information, law enforcement, facility maintenance, or resource protection). The riverway also had eight permanent clerical administrative support positions. Most of these positions served both the upper and lower riverway, which means their responsibilities spanned 227 river miles. This is an insufficient number of staff to perform all NPS duties and responsibilities for the riverway, including maintaining and protecting cultural and natural resources, providing visitor and interpretive services, maintaining facilities, enforcing rules and regulations, and coordinating activities with other land managers. The long distances employees must frequently travel to accomplish their jobs further stresses their already full workloads. For example, it is not uncommon for an employee to travel more than 300 miles to perform a single task at a particular landing or other visitor use facility.

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS MANAGEMENT PLAN

There are several planning efforts underway both within the riverway and within the larger watershed that have relevance to this management plan.

A cooperative management plan for the Lower St. Croix National Scenic Riverway from Taylors Falls dam south to the confluence with the Mississippi River is being developed concurrently with this management plan for the Upper St. Croix National Scenic Riverway. The plan for the Lower St. Croix will also address an

array of management issues. Although there is a clear link between the two areas and their management, and the planning processes are related, the distinction is that the Lower St. Croix is cooperatively managed by the National Park Service and the states of Minnesota and Wisconsin. The two states, as well as the Minnesota–Wisconsin Boundary Area Commission, are full planning partners in the development of the plan for the Lower St. Croix, as is a citizens’ planning task force. The task force is open to the public and provides an extensive forum for public input to the plan. This planning process began in November 1995 and is expected to be completed in the summer of 1999.

In conjunction with the preparation of the cooperative management plan for the Lower St. Croix National Scenic Riverway, a watershed stewardship statement will be prepared by the Lower St. Croix planning task force. This statement will be a vision-type plan, containing general goals for the Lower St. Croix River watershed and broad recommendations for actions by others. What happens within the riverway is strongly influenced by what happens in the whole watershed. Collaborative planning will be undertaken to develop a future vision for the watershed and its stewardship. The product will be a report that outlines visions and recommendations for wise management of the watershed by its citizens and local leaders.

The National Park Service also is participating in two other ongoing interagency planning efforts that may affect the management of the upper riverway. The *St. Croix Mussel Management Plan* is being developed by the National Park Service, the Minnesota and Wisconsin Departments of Natural Resources, the U.S. Fish and Wildlife Service, the University of Minnesota, and Macalester College. The plan will provide direction for the conservation of mussels in the St. Croix and will be based on the national native mussel conservation strategy. The *Interstate Aquatic Nuisance Species Management Plan* is addressing what to do about nuisance aquatic fauna and flora that are adversely affecting, or could adversely affect, the riverway’s native populations. This plan is being prepared

by the Minnesota and Wisconsin Departments of Natural Resources, the U.S. Fish and Wildlife Service, and the National Park Service.

The National Park Service has prepared a *Water Resource Management Plan* (NPS 1997) to guide actions in the federally administered portions of the Upper and Lower St. Croix segments. This plan summarizes existing data; recommends additional research, inventories, and monitoring; and addresses management issues such as establishing a cooperative interagency database. Work on this plan began in October 1994 and was completed in spring 1997.

A St. Croix River basin water resources management plan is being prepared by an interagency task force, which includes the U.S. Geological Survey, the National Park Service, the Wisconsin and Minnesota Departments of Natural Resources, the Minnesota Pollution Control Agency, and the Minnesota–Wisconsin Boundary Area Commission. This project’s goal is to protect and improve the quality of the surface and groundwater resources of the St. Croix River basin through coordinated planning and management. This project began in 1993; elements of this process were completed in 1995, and other elements are scheduled for completion in 1997, 1999, and 2001.

The National Water Quality Assessment Program examines the status and trends in water quality in the Upper Mississippi River basin between Royalton, Minnesota, and Lake Pepin (in both Wisconsin and Minnesota), including the St. Croix basin. This study, led by the U.S. Geological Survey, is aimed at providing water-quality information to policy makers; as such, it contributes valuable information to the St. Croix River Basin water resources management plan process. This study began in March 1994, and a report is scheduled to be completed in 2001.

The *St. Croix Zebra Mussel Task Force Action Plan* presents a strategy to prevent or slow the spread of the zebra mussel into the St. Croix riverway. The task force, which is composed of representatives of the Park Service, the Minnesota and Wisconsin Departments of Natural Resources, the U.S. Fish and Wildlife Service,

and the Minnesota–Wisconsin Boundary Area Commission, updates this plan periodically.

Several other NPS plans that relate specifically to the riverway have been completed, including the *Resources Management Plan*, the *Land Protection Plan*, and the “Statement for Management.” These plans are updated periodically.

Because the boundary of the riverway either includes or is directly adjacent to several state and county properties, there are many state plans that could significantly influence the riverway. These include resource management plans for St. Croix and St. Croix Wild River State Parks and St. Croix and Chongwatana State Forests (MNDNR 1975), the *Governor Knowles State Forest Master Plan* (WIDNR 1988), comprehensive land use plans for county forests, and the *Land and Resource Management Plan*, *Chequamegon National Forest* (FS 1986).

WHAT IS NEXT IN THE PROCESS?

The public review and comment period for this draft document will be 45 days. Comments on the draft plan will be reviewed, and appropriate changes will be made to the plan. Various elements of the preferred alternative and other alternatives might be modified to address comments. Following the public review of the draft plan, a *Final General Management Plan* / “Finding of No Significant Impact” will be issued or a notice of intent to prepare an environmental impact statement will be issued.

For more information or questions about this plan, please contact:

Superintendent
St. Croix National Scenic Riverway
401 Hamilton Street
P.O. Box 708
St. Croix Falls, WI 54024-0708
(715) 483-3284



ALTERNATIVES, INCLUDING
THE PREFERRED ALTERNATIVE

INTRODUCTION

This section describes a range of alternatives for use and management of the upper riverway over the next 15–20 years, including alternative 1, the preferred alternative; alternative 2, which allows an increase in recreational opportunities; and alternative 3, a no-action alternative that provides a basis for comparison. There are four main parts to this section — a description of the significance and purpose of the riverway, a description of management direction / actions that would be common to all of the alternatives, an explanation of and description of the management areas that would be applied under alternatives 1 and 2, and a description of the alternatives themselves. There is also a description of alternatives that were originally considered but not analyzed further. This section and the section that analyzes the environmental consequences of implementing these alternatives form the core of the *Draft General Management Plan / Environmental Assessment* for the Upper St. Croix National Scenic Riverway. Table 2 at the end of this section summarizes the key differences between the alternatives, and table 18 summarizes the key differences in the impacts of implementing the alternatives.

In developing the common management actions and the alternatives for managing the upper riverway, the planning team considered the riverway's purposes and significance, the National Park Service's mission, mandates and constraints, and the public's views on desired future conditions for the upper riverway. Alternatives that are not consistent with the riverway's purposes or do not maintain its significance are not reasonable alternatives. The alternatives also must be consistent with existing legislative mandates (e.g., the Wild and Scenic Rivers Act, the NPS organic act, the General Authorities Act, and the Endangered Species Act), NPS policies, and applicable regulations.

Although the National Park Service has broad authority to set regulations, no new regulations are included in this plan. Instead of setting the

regulations, this plan presents a management philosophy under which it can be determined what regulations might be needed. The approved alternative and common management actions might result in new regulations of some uses in the future. In many cases, before the National Park Service would implement any regulations, data would be collected and analyzed, and additional opportunities would be provided for public input. Proposed regulations would then be printed in the *Federal Register* to solicit public comment.

SIGNIFICANCE AND PURPOSES OF THE UPPER ST. CROIX NATIONAL SCENIC RIVERWAY

The significance and purposes of the Upper St. Croix National Scenic Riverway are the foundation for this general management plan and set direction and limits for the plan. The **significance** of the upper riverway addresses what makes the area special — why it is important to our natural and/or cultural heritage and how it differs from other rivers in the country. The riverway's **purposes** tell why the Upper St. Croix / Namekagon Rivers were set aside as a unit in the national wild and scenic rivers system.

Together, the purpose and significance statements help describe the upper riverway's environment and are basic to all assumptions about the area and the ways in which it should be used and managed. All of the alternatives and management directions in this management plan should be consistent with and support the upper riverway's purposes and significance. Based on the upper riverway's enabling legislation, legislative history, NPS policies, riverway plans, public input, and input from the planning team, the following significance and purpose statements were identified for the Upper St. Croix National Scenic Riverway.

SIGNIFICANCE

Significance is what makes the area special — why it is important to our natural and/or cultural heritage and how it differs from other rivers in the country.

- The St. Croix River is one of the last undisturbed large floodplain rivers in the Upper Mississippi River system.
- The riverway is an unrivaled combination of exceptional natural resources and scenic, aesthetic, cultural, and recreational values in proximity to major urban population centers in the upper Midwest.

Natural Resource Values

- Ninety percent of the upper riverway retains the essential qualities of a free-flowing river in spite of the presence of several small dams and one large dam.
- The high quality of the water of the Upper St. Croix River resulted in both Wisconsin and Minnesota designating it as “outstanding resource waters,” which is the highest designation possible.
- The St. Croix National Scenic Riverway is a protected north-south corridor that serves as a refuge for large populations of diverse flora and fauna, including federal and state-listed threatened and endangered species.
- The St. Croix River contains the greatest diversity of mussel fauna in the Upper Mississippi River system.

Scenic, Aesthetic, Cultural, and Recreational Values

- The Upper St. Croix combines high-quality river canoeing with multiday canoe camping along 200 miles of scenic, publicly managed and accessible, relatively undeveloped river shoreline.
- As they travel the river, visitors can observe the convergence of three terrestrial biological communities (prairie, hardwood forest, and coniferous forest) and cold- and warm-water communities.
- The St. Croix River has a national reputation for excellent smallmouth bass fishing and the Namekagon River for trout fishing.
- Visitors have extended opportunities to experience the solitude and beauty inherent in the riverway’s exceptional natural resources.
- The St. Croix and Namekagon Rivers, a traditional corridor between the Great Lakes and the Mississippi Valley, retains numerous archeological and historic resources that reflect centuries of human use of a riverine environment.

PURPOSES

The purposes tell why the Upper St. Croix / Namekagon Rivers were set aside as a unit in the national wild and scenic rivers system.

- To preserve the Upper St. Croix River and its Namekagon tributary in a natural condition and as a relatively free-flowing river.
- To protect and enhance the exceptional natural and scenic resources of the riverway for current and future generations.
- To provide high-quality recreational opportunities that do not detract from the exceptional natural, scenic, and aesthetic resources.

ACTIONS COMMON TO ALL ALTERNATIVES

Several management actions need to be taken on the upper riverway regardless of which alternative is approved by the National Park Service. These management actions would be taken under all of the alternatives. Most of these management actions are based on existing laws, NPS policies, and general planning principles. They all support the purposes and significance of the upper riverway.

COOPERATION WITH STATE PARKS AND FORESTS

Four state parks are within or adjacent to the upper riverway's boundary — Minnesota and Wisconsin Interstate Parks, St. Croix Wild River State Park, and St. Croix State Park. The National Park Service historically has had a close working relationship with these parks and with Governor Knowles State Forest because of their proximity and similar missions. The National Park Service would continue to foster this special relationship. Whenever possible, the National Park Service would coordinate its programs (e.g., interpretation and law enforcement) with the adjacent state parks and Governor Knowles State Forest, sharing equipment and expertise, conducting joint resource and visitor surveys, exchanging data, cofunding research, and participating in interagency activities to meet mutual management needs.

COORDINATION WITH AGENCIES AND ORGANIZATIONS

There are many agencies, organizations, and individuals both within and outside the riverway that affect the management and use of the Upper St. Croix National Scenic Riverway, including the Upper St. Croix Management Commission and its member organizations (see "The Planning Process" section), eight counties, eight communities, the U.S. Fish and Wildlife

Service, Chequamegon National Forest, the Environmental Protection Agency, and St. Croix and Chongwatana State Forests. The cooperation of all these parties is essential to the effective and efficient management of the upper riverway; the National Park Service cannot ensure the protection of the riverway's resources and maintain high-quality visitor experiences without the cooperation and assistance of these groups. The National Park Service has maintained a close dialogue with the commission and would continue to do so in addition to continuing to uphold commission policies (see appendix C). Dialogue with all of these parties would continue.

NATIVE AMERICAN RELATIONSHIPS

Approximately 136 acres of the reservation of the St. Croix Chippewa Indians of Wisconsin are within the boundary of the upper riverway near Danbury. In addition, several Chippewa bands have off-reservation hunting, fishing, and gathering treaty rights on the riverway. None of the alternatives would affect the exercise of the 1837 treaty-reserved rights. The National Park Service recognizes these treaty rights and would work to strengthen dialogues and work with the tribes and the Great Lakes Indian Fish and Wildlife Commission to ensure that the rights were honored and that issues of common interest were addressed.

NATURAL RESOURCE MANAGEMENT

The upper riverway's natural resources would continue to be managed in accordance with NPS policies and regulations and the Upper St. Croix Management Commission's policies (see appendix C). The National Park Service would strive to maintain all the components and processes of the riverway's naturally evolving ecosystems, including the natural abundance,

diversity, and ecological integrity of the riverway's plants and animals.

The National Park Service would focus its efforts on achieving the following natural resource management goals:

- Identify, maintain, and protect the natural ecological processes occurring in the river and its immediate environs.
- Encourage the restoration of the St. Croix and Namekagon Rivers to a natural, free-flowing condition over the long term.
- Maintain or restore the riverway's biotic resources to their natural condition while adhering to the principles of conservation biology.
- Minimize impacts of human activities, developments, and uses on riverway resources.
- Establish systems to monitor the condition of key natural resources and to identify and monitor threats to those resources.
- Develop a resource database capability that can be used to analyze and correlate riverway data.

In February 1995 the National Park Service approved a *Resources Management Plan* (NPS 1995c) for the entire St. Croix National Scenic Riverway, which is now being implemented as funding allows. The purpose of the *Resources Management Plan* is to provide a management framework to assess, conserve, and manage the natural and cultural resources of the riverway. The riverway's problems and needs are described, and methods to be used to manage riverway resources are identified. A variety of management actions, research needs, and baseline studies are integrated into this comprehensive *Resources Management Plan*.

The table in appendix D summarizes the resource management actions in the *Resources Management Plan* that the National Park Service is funding or seeks to fund in the future.

WATER QUALITY

One of the St. Croix National Scenic Riverway's significant resources is its water. All of the upper riverway is designated by the two states as outstanding resource waters, which is the highest designation possible. Although the upper riverway has high water quality, there are some signs of degradation occurring. Park biologists believe that most of the pollution entering the St. Croix and Namekagon Rivers is coming from sources outside of the riverway, such as agricultural runoff and sedimentation (see table 3 on page 65).

The National Park Service would continue to monitor the upper riverway's water quality and work with the Environmental Protection Agency, Minnesota Pollution Control Agency, Wisconsin Department of Natural Resources, and the U.S. Geological Survey to identify and mitigate water pollution sources within and outside the riverway boundaries. (See also "Future Plans and Research Required" and "Relationship of Other Planning Efforts to This Management Plan" sections.)

THREATENED AND ENDANGERED SPECIES

Under the Endangered Species Act, the National Park Service is mandated to promote the conservation of all federal threatened and endangered species and their critical habitats within the riverway boundaries. The gray wolf and bald eagle are the only known species on the federal list that occur in the upper riverway. Also, the lynx is a candidate species for listing that might occur in the upper riverway. The National Park Service would work with the U.S. Fish and Wildlife Service, the Minnesota and Wisconsin Departments of Natural Resources, and tribal governments to ensure that its actions helped these listed species to recover; no actions would be taken that would adversely affect the recovery of these species or impact critical habitat. In addition, as called for in the Upper St. Croix Management Commission's policies, the National Park Service would cooperate with the two state departments of natural resources, the U.S. Fish and Wildlife Service, and the Great

Lakes Indian Fish and Wildlife Commission in inventorying, monitoring, protecting, and perpetuating the natural distribution and abundance of special status species (i.e., federal and state-listed threatened and endangered species, federal candidate species, and species of special concern).

VEGETATION MANAGEMENT

The National Park Service would protect the riverway's natural vegetation by taking actions to prevent the spread of exotic plants; replanting damaged campsites, eroded areas, and other disturbed sites; restoring prairie remnants; and monitoring changes in vegetation. Special attention would be paid to sensitive areas such as riparian and wetland communities to ensure that these areas were protected. In the pine plantations under NPS jurisdiction, native vegetation and natural succession would be encouraged through selective or patch cutting, prescribed burning, or other means. The National Park Service would also work with the two state departments of natural resources to address fire management on the upper riverway, including the reintroduction of fire as a natural process in certain plant communities.

Under NPS policies, diseases and insect outbreaks would be controlled if they involved exotic species or if they posed a threat to threatened, endangered, or unique plant specimens or communities or to other plant communities outside the riverway. The National Park Service would continue to employ an integrated pest management approach in addressing disease and insect outbreaks. All feasible nonchemical methods would be exhausted before chemicals were used in the riverway.

Logging operations are expected to continue on county forests within the upper riverway boundary. The National Park Service would work with the county forests to ensure that logged areas are set back at least 100 feet from the rivers' banks and to encourage logging practices that minimized impacts on riverway resources.

WILDLIFE MANAGEMENT

The Upper St. Croix National Scenic Riverway supports a diversity and abundance of wildlife. The National Park Service focuses on an ecosystem management approach to wildlife management. In all of the alternatives the National Park Service would continue to maintain, perpetuate, and restore native wildlife populations and their habitats as part of the riverway's natural ecosystems. The management emphasis would be on inventorying and monitoring selected wildlife populations and on minimizing human impacts on animal population dynamics. Natural processes would generally be relied on to control populations to the greatest extent possible.

Beaver populations appear to have increased in recent years, and their potential impact on other natural resources is a concern on the upper riverway. The National Park Service would work with the states and tribes to determine if beaver populations were at unacceptable levels. If populations were excessive, the National Park Service would cooperate with the states and tribes in resolving problems.

Until 1986 the National Park Service allowed the trapping of beaver and other fur-bearing animals in the riverway in accordance with state laws and regulations. In the case of the *National Rifle Association of America vs. Potter*, the federal court upheld a decision that allowed trapping and hunting in national park system areas only where specifically authorized by Congress. The Wild and Scenic Rivers Act of 1968, the enabling act for the Upper St. Croix National Scenic Riverway, allows hunting but does not address trapping. Therefore, trapping by non-Indians is prohibited on federal land and waters in the riverway administered by the National Park Service as determined by the federal court.

Interest in eliminating this court-imposed ban on trapping has been renewed by price increases for beaver pelts. However, any revision of the trapping ban would have to be pursued by

legislative efforts. This issue is outside the scope of this plan.

The National Park Service would continue to assist the two states and Native American tribes in regulating sport hunting and subsistence harvests of wildlife within the riverway. The National Park Service would work to ensure that all harvests are sustainable and consistent with sound resource management principles.

FISHERIES MANAGEMENT

The National Park Service would work with both states to maintain the diversity and abundance of the riverway's native fisheries and to maintain and restore their aquatic habitat. No efforts would be made to remove exotic sport fish from the riverway, provided they do not become a threat to native species, ecological communities, or natural ecological processes. The National Park Service would also cooperate with the two states and Native American tribes in managing the upper riverway's fisheries. In all cases, the National Park Service would strive to ensure that fish harvests were sustainable and consistent with sound resource management principles. (See also the "Future Plans and Research Required" section.)

EXOTIC SPECIES

The Upper St. Croix National Scenic Riverway has a number of exotic plant species. Some of these plants, such as purple loosestrife and spotted knapweed, are threats to the riverway's natural ecosystems. As called for in the Upper St. Croix Management Commission's policies, under all alternatives only native vegetation would be planted within the riverway. The National Park Service would survey and monitor the riverway for the presence of exotic plant species. It would control as best it can those exotic species that are a hazard to public safety, damage historic or archeological resources, interfere with natural processes and the perpetuation of natural features or native species, or significantly hamper the management of the river-

way or adjacent lands. High priority would be given to controlling exotic species that have a substantial impact on the riverway's resources and that can reasonably be expected to be successfully controlled. As described in NPS *Management Policies* and the riverway's *Resources Management Plan*, the National Park Service would use integrated pest management procedures to determine how to control the exotics.

The zebra mussel has not yet spread to the St. Croix and Namekagon Rivers; however an isolated find of zebra mussels occurred 2 miles north of the Taylors Falls dam in July 1997. A zebra mussel prevention plan has been prepared and is routinely updated. The National Park Service would continue to monitor for the presence of the zebra mussel, inform and educate the public about the mussel and the threat it poses, and take action as the situation dictates.

SAND AND GRAVEL MINING

With increasing development in the region there likely will be additional demand for sand and gravel operations near the riverway, which would increase the potential for the introduction of sediments flowing into the riverway and other impacts. The National Park Service would work with the states, counties, and private landowners to ensure that the potential environmental impacts of sand and gravel operations were avoided or minimized.

PRESERVATION OF NATURAL SCENIC VALUES

The National Park Service would strive to maintain the natural scenery along the riverway, including the broader natural landscape that is visible from the rivers. The purposes of the riverway state that the rivers should be preserved in a relatively natural condition, and that the exceptional natural and scenic resources should be protected. New developments within the riverway boundary on federal lands would be restricted, and those that were built would be designed to blend in with the natural environ-

ment. The National Park Service also would work with state, county, and local government landowners and private landowners in or near the riverway to encourage them to maintain the natural scenery along the riverway, including the broader natural landscape that is visible from the rivers. In addition, the National Park Service would continue to abide by the Upper St. Croix Management Commission policies in all of the alternatives (see appendix C).

RIVER CROSSINGS

Because there are already numerous river crossings, the National Park Service would discourage new crossings for bridges, roads, trails, railroads, and utility lines. The replacement of bridges and other utility crossings would be permitted only if they met the requirements of the Wild and Scenic Rivers Act. The National Park Service would work to consolidate crossings wherever possible, place new bridges and utilities in existing corridors, and find solutions that would not impact riverway resources.

CULTURAL RESOURCE MANAGEMENT

The National Park Service would continue to inventory and evaluate the significance of cultural resources and perform compliance for any undertakings that might impact national register properties or properties that are eligible for listing on the national register. Cultural resources consist of archeological sites, residential structures, and remnants of the logging era. More than 200 archeological sites have been identified on federal lands on the upper river. Riverway staff would consult NPS archeologists regarding ground-disturbing projects and would conduct surveys or excavations as needed. The primary goal would be to protect and preserve sites in place.

Surveys and research are being conducted to identify historic structures. Most, if not all, nonhistoric structures would be removed to (1)

meet the goal of restoring the natural scene along the river corridor, and (2) remove buildings that might over time attract vandals and squatters, and (3) to eliminate potential safety hazards.

Historic properties would be identified in consultation with the state historic preservation offices of Wisconsin and Minnesota. The National Park Service and state historic preservation officers would evaluate a full range of alternatives for historic structures — from preservation and restoration to removal. The National Park Service would also support the efforts of state historic preservation offices and others to help preserve cultural resources within or adjacent to riverway boundaries.

VISITOR USE MANAGEMENT AND SAFETY

VISITOR USE

Activities that are compatible with and do not detract from the riverway's exceptional resources would be promoted.

Water Uses. A variety of motorized and non-motorized recreational uses, including canoeing, fishing, and motorboating would continue to be permitted on the Upper St. Croix National Scenic Riverway unless it was demonstrated that a use was adversely affecting the riverway's exceptional resources and values or public safety. The National Park Service also would work to promote uses and behaviors that would ensure quality experiences for all visitors and that would help maintain and protect the riverway's resources. (Please see the "Future Plans and Research Required" section for information about personal watercraft.)

Spring / Summer / Fall Terrestrial Uses. With regard to terrestrial recreational uses, existing uses (e.g., horseback riding, mountain biking, hiking, and the use of motorized vehicles) would continue to be permitted in the upper riverway unless it was determined that a use was adversely affecting the riverway's exceptional

resources and values. Horse use would continue to be permitted at current levels but would be limited to the shoulders of designated roadways and trails designated for horses. Bicycles would continue to be allowed at current levels but would be limited to established roads where motor vehicles are now permitted. The National Park Service would work with equestrian and bicycle groups and state agencies to determine other areas where these uses might be permitted to cross the riverway corridor.

The National Park Service would continue to permit land-based motorized vehicles (e.g., motorcycles, all-terrain vehicles [ATVs], and 4 x 4s) on established roads in the riverway, subject to state and local regulations. Driving off established routes would be prohibited.

Winter Uses. The upper riverway is primarily used by visitors between the spring and fall. However, some winter use (snowmobiling, ATV use, cross-country skiing, and snowshoeing) occurs. These winter uses would continue to be permitted as long as it was determined that they were not adversely affecting the riverway's exceptional resources and values.

ATVs would continue to be allowed on designated snowmobile trails in Wisconsin; however, ATVs would be prohibited on snowmobile trails in Minnesota.

Snowmobiles and ATVs would continue to be able to use the frozen river surface of the St. Croix from Riverside to St. Croix Falls and on designated trails that traverse the riverway unless it was demonstrated that this use was adversely affecting the riverway's exceptional resources and values or public safety. The riverway north of Riverside on the St. Croix and the entire Namekagon River are generally closed to snowmobile use as stated in 36 *Code of Federal Regulations* 7.9. However, the riverway also could be crossed in these (closed) areas with prior NPS approval, assuming there were no safety, visitor experience, or resource concerns. In line with NPS policies, the National Park Service would continue to work with snow-

mobile groups to determine the best locations for designated crossings.

With regard to cross-country skiing and snowshoeing, the National Park Service would continue to maintain existing cross-country skiing trails at Sandrock Cliffs and Trego, subject to funding. Snowshoers and skiers would be permitted to continue to travel off-trail throughout the riverway and winter camp unless it was determined that unacceptable negative impacts on resources were occurring.

VISITOR SAFETY

Although visitors assume a certain degree of responsibility for their own safety when visiting the upper riverway, the National Park Service would strive to ensure that there were no hazards that posed a serious threat to human health and safety. Actions to prevent known hazards would not conflict with NPS mandates to preserve the riverway's resources.

FEES

All operations and visitor activities would be reviewed to see if the application of fees was appropriate, as recommended in the NPS fee demonstration program.

ACCESSIBILITY FOR INDIVIDUALS WITH DISABILITIES

The National Park Service's *Management Policies* state that visitor and management facilities will be made as accessible as practicable, depending on the nature of the area and of the facility, to persons with visual, hearing, mobility, and mental impairments. Because of the relative low risk and slow-moving waters of sections of the upper riverway, the area is used to a large degree by people with disabilities. However, it would not be possible to make all facilities, programs, and services available to all people at all times.

The National Park Service would strive to provide the highest level of accessibility possible to buildings, facilities (including primitive recreational facilities), programs, and services, consistent with the nature of the area, the conservation of riverway resources, and the mandate to provide a quality experience for everyone. Nonmotorized access for individuals with disabilities would be encouraged through the use of assistance organizations. Any new visitor or employee facility in developed areas, and any alterations to existing facilities, would be designed and constructed or rehabilitated in accordance with the *Uniform Federal Accessibility Standards* (49 FR 31528) to provide full accessibility to individuals with disabilities. Wherever possible, facilities and programs would be available to people with sensory and mental disabilities, and information on the location of accessible facilities and activities would be available.

INTERPRETATION

In 1995 the National Park Service approved an interpretive prospectus for the riverway (NPS 1995a). This prospectus identifies interpretive themes based on the area's purposes, significance, and diverse resources; it also proposes new media to improve the overall interpretive program. The themes would remain the same regardless of which alternative is approved for managing the area.

The interpretive prospectus also proposes a series of actions that would resolve interpretive services, correct facility and media deficiencies, meet the needs of riverway users, and generate a regional commitment for resource protection. Audiovisual programs and equipment would be upgraded to improve accessibility and to incorporate advancing technology. A new wayside exhibit plan would be developed and implemented to thematically interpret park resources. New, professionally planned and produced museum exhibits focusing on natural and cultural history, recreation, and stewardship would replace temporary or outdated exhibits. The National Park Service would market its

interpretive program to visitors and ensure that meaningful visitor experiences were provided at the Marshland, Saint Croix Falls, and Namekagon visitor centers.

The National Park Service has forged many partnerships with the states of Minnesota and Wisconsin, counties, towns, schools, and private interests regarding visitor services and interpretation on the upper riverway. Cooperation among all those entities would continue to be essential to maintain and improve high-quality visitor services. In this regard, the National Park Service would continue to support the St. Croix Valley Interpreter's Association, an informal alliance of interpreters in the area. NPS interpreters would continue to present partnership interpretive programs at federal, state, local, and private facilities, especially campgrounds. The riverway staff would continue to cooperate with state and local parks and other visitor service providers to improve facilities used jointly for campfire programs. The riverway staff would also work with these entities to develop sign guidelines to improve visitor information and direction.

OUTFITTERS AND CONCESSION OPERATIONS

The number of people using outfitters on the upper riverway appears to have increased over the past several years, and these operations have the potential to significantly affect the experience of visitors on the riverway, as well as the riverway's resources. Therefore, the National Park Service would evaluate the need to place outfitters operating on the Upper St. Croix National Scenic Riverway under an incidental business permit system. (Please see the "Future Plans and Research Required" section for more detail.)

Currently, there does not seem to be a large demand for the types of goods and services that could be provided through concessioner operations. A policy for providing goods and services via concessioner operations within the upper riverway would be developed if demand

warranted. (Please see the “Future Plans and Research Required” section for more detail.)

LAND PROTECTION ACTIONS

The upper riverway’s *Land Protection Plan* (NPS 1984) identifies which lands or interests in lands are necessary to accomplish the intent of the Wild and Scenic Rivers Act and/or riverway management objectives. All alternatives would refer to this plan for land protection information and priorities.

FUTURE PLANS AND RESEARCH REQUIRED

This section lists future research, plans, and studies that are needed. These studies are seen as extensions of the *General Management Plan* or the *Master Plan* and would adhere to the philosophical guidance of those plans. The research and specificity of these future plans would better enable the superintendent and riverway staff to make good, informed decisions. Some of these studies have been mentioned previously.

- **specific fisheries recommendations** — The *Fisheries Management Plan*, which will address such issues as habitat loss, user conflicts, the presence of exotic sport fish, and stocking programs, is in progress.
- **resolution of the headquarter’s building foundation problem** — The riverway headquarters / visitor center building in St. Croix Falls has structural problems and does not have adequate office space for the staff. A development concept plan needs to be prepared for repair and/or redesign of the existing facility or construction of a new facility or facilities to meet management needs.
- **camping opportunities** — No major campgrounds exist in or near the upper riverway north of Danbury. Thus, the National Park Service would work with the states, counties, and local governments to prepare a demand/market study on camping opportunities in this area. The study would examine different

alternatives for providing camping opportunities, with entities other than the National Park Service building and operating the campground(s). The National Park Service favors private campgrounds outside of the riverway boundaries.

- **resolution of the proposals to expand marinas on the Taylors Falls Flowage** — The resolution of the marina proposals on the Taylors Falls Flowage would be addressed in a future action plan.
- **outfitter operations** — The National Park Service would evaluate the need to place outfitters operating on the upper riverway under an incidental business permit (IBP) system. The purposes of this permit system would be to ensure compliance with 16 USC 1(a)(1) as reinforced by NPS regulations 36 CFR 5.3, to ensure that opportunities for a quality visitor experience were maximized, to encourage the highest degree of visitor safety and interpretation of the resources, and to ensure that riverway resources were protected. To determine the impacts of the outfitter operations on the resources, the IBP system would also gather information to use in future planning efforts to ensure that the authorized services would not have an adverse impact on park resources. If an IBP system was needed, riverway staff would work with outfitters to develop the system.
- **concessioner operations** — A policy for providing goods and services via concessioner operations within the riverway would be developed if demand warranted. Does the National Park Service need to provide any goods or services that are not currently available from businesses operating outside the riverway? The National Park Service should only consider contracting for concessioner services if such services were necessary and appropriate for public use and enjoyment of the national park area in which they were located and if they were consistent to the highest practicable degree with the preservation and conservation of the areas. If concession services were provided, additional staff and staff time would be required to manage and monitor concession contracts.

- **inner tubing on the river** — Concerns have been raised about the apparent increase in inner tubing along certain sections of the riverway and the impacts this activity may be having on significant park resources. The National Park Service would evaluate the need to place commercially outfitted inner tubing under an incidental business permit or a concessions contract. Data would be collected and public input would be sought to determine if such an action was needed.
- **water pollution from sources outside of the riverway** — The National Park Service would continue to work with other state and federal agencies as they develop and implement a comprehensive basin water quality management plan, as called for in the Upper St. Croix Management Commission's policies. This plan has been started.
- **sustainability** (conserving natural and cultural resources; also see pg. 131) — A comprehensive action plan would be developed to incorporate sustainable practices into riverway operations. Riverway staff would review all operations and determine how to perform routine tasks or functions with less impact on riverway, regional, and global resources.
- **the effects of the operation of the Northern States Power Company dams** — The effects of the dams on riverway resources would be studied (e.g., in-stream flows, aquatic communities, and riparian communities).
- **rights-of-way vegetation management plan** — There are numerous rights-of-way in the riverway to accommodate transmission lines, distribution lines, and pipelines. Most of these rights-of-way predate the Wild and Scenic Rivers Act and are held by a variety of utility companies. Consequently, there is no consistency of maintenance practices on these areas. With the participation of the owners of the rights-of-way, a vegetation management plan needs to be prepared to establish consistent maintenance, vegetation management, and clearing practices among these various entities.
- **personal watercraft** — Several concerns have been raised by the public, riverway managers, and both state departments of natural resources regarding the use of personal watercraft on the upper riverway. There are concerns about visitor safety, impacts on quiet and solitude, and impacts on other visitors' experiences, riverway resources (e.g., disturbance of bottom sediments and bank erosion), and adjacent landowners. The National Park Service, in consultation with both state departments of natural resources, would determine the appropriateness of personal watercraft use on the riverway. Data would be collected and public input would be sought to make this determination.
- **visual quality documentation** — Documentation of the natural scenic resources in the riverway would serve as the basis for long-term preservation of these resources.
- **monitoring external pollution** — Pollution from external sources would be monitored; a watershed plan (as is being done for the lower riverway) would be encouraged if monitoring showed increasing or unacceptable levels.
- **baseline inventories** — Baseline data would be collected and evaluated for natural resources, such as old-growth biotic communities, vegetation, reptiles, amphibians, and the distribution of riparian animals. Monitoring would be done to determine if population changes were occurring.
- **mussel monitoring / research** — The National Park Service would inventory and monitor populations, establish criteria for suitable habitat, identify potential impacts on populations and habitat, reduce impacts, preserve and restore habitat, research mussel reproduction and determine host fish for individual species, and develop a mussel management plan for St. Croix.
- **cultural resource management** — Additional work is also needed to identify the riverway's cultural landscapes and determine their significance. The completion of the riverway's cultural landscape inventory would help in assessing the impacts of any future management decisions on the riverway's historic or cultural landscapes. Several other surveys and inventories, as

listed below, would need to be completed to further document the upper riverway's significant cultural resources:

- National Register of Historic Places documentation for the riverway's significant sites and structures
- update archeological overview and assessment for the upper riverway
- a cultural landscape report for any significant landscapes identified in the cultural landscape inventory
- an ethnographic overview and assessment that analyzes data on the upper riverway's

ethnographic resources and the groups who identify these resources as significant to their ethnic heritage

- a cultural affiliation study to identify cultural ties among past and existing groups who occupied or used the upper riverway's resources

The National Park Service would also coordinate with others in the historic preservation community to explore how the results of these studies could be used to ensure appropriate management and the long-term preservation of the riverway's cultural resources.

MANAGEMENT AREAS

In developing management alternatives for the upper riverway, decisions needed to be made on what visitor uses/experiences, developments, and resource conditions would be appropriate and inappropriate in different parts of the riverway. Management areas identify acceptable resource conditions and visitor experiences in the riverway, consistent with the riverway's purposes. Management areas identify how different portions of the riverway could be managed to achieve desired resource and visitor experiences/social conditions. Different actions would be taken by the National Park Service in different areas with regard to the types and levels of uses and facilities.

The four management areas described below are the primary building blocks for alternatives 1 and 2; the key differences between them are summarized in table 1. Different alternatives have different management areas and/or varying arrangements of the areas, depending on the alternative's direction. Management areas were not applied to the no-action alternative (3), which is a continuation of management under the 1976 *Master Plan*.

It is important to note that the management areas in the alternatives apply only to federal (NPS) lands within the riverway boundary. However, the National Park Service would encourage tribal, state, county, town, and other landowners within the boundary to manage their lands in a manner consistent with the desired management area conditions.

NEAR-PRIMITIVE NORTHWOODS AREA

An area managed as near-primitive northwoods would provide a natural landscape that is typified by or reflects the northwoods ecosystem. There might be signs of people, but generally it would look like a natural, remote, primitive area. Visitors would likely encounter

MANAGEMENT UNDER THE WILD AND SCENIC RIVERS ACT

Managing the St. Croix River and its Namekagon tributary as relatively free-flowing and in natural conditions, under the Wild and Scenic Rivers Act, is different than the intent of preserving lands or rivers in their undeveloped primeval conditions under the Wilderness Act. Wilderness management, such as the management of the Boundary Waters Canoe Area, requires adherence to much stricter regulations.

wildlife, and there would be many opportunities for high-quality fishing. Most visitors would be on foot, paddling, or engaged in other human-powered outdoor recreational activities, although some low-speed motorboat travel would also be permitted. With limited access into this area, visitors would have many opportunities to find solitude and quiet; encountering other visitors and riverway staff would happen infrequently. These areas would offer opportunities for challenge and adventure. Developments, including NPS facilities, would be rare — one could go for long stretches and see no development. Small, primitive campsites (i.e., cleared areas, with fire rings and pit toilets, that are not accessible by road), designated trails, and access points might be present. Onsite controls and restrictions might be used for resource protection and visitor safety, including some resource modifications that blend in with the natural environment.

NORTHWOODS RECREATION AREA

The northwoods ecosystem would also be a key element of the visitor experience in this management area. These areas generally would appear natural, but signs of people would be evident periodically. Visitors would likely see wildlife, and there would be opportunities for high-

quality fishing. This management area would support a higher intensity of use than the near-primitive northwoods management area; the probability of encountering other visitors and land managers would be moderate. There still would be opportunities for solitude, challenge, and adventure. Most visitors would be on foot, paddling, or engaged in other human-powered outdoor recreational activities. Some visitors also would be using low-speed motorboats. Motorboats traveling at moderate speeds from point to point might be occasionally allowed in this area if they could coexist with other uses. However, in the preferred alternative from Nevers Dam to river mile 55, which would be in the northwoods recreation management area, there would be a mix of human-powered watercraft and motorboats; motorboats operating at moderate speeds could be accommodated if they could coexist with other users. Visitor noise might be more evident in this area.

Access points would be more numerous than in the near-primitive northwoods area, and they would also be designed to handle higher volumes of use. Developments along the riverway would be occasionally encountered, including NPS landings, which might contain developed campsites (i.e., cleared areas, often accessible by road, with fire rings, picnic tables, vault toilets, trails, and signs), primitive campsites not accessible by road (i.e., cleared areas, with fire rings and pit toilets), and small interpretive structures. There might be more onsite controls and restrictions for resource protection and visitor safety purposes in this area. Some resource modifications would be evident, but they would blend with the natural environment.

Waterskiing would be allowed only on the flowages within this management area; however, the National Park Service might want to manage this activity in the future to protect the resources and visitor experience.

DEVELOPED RECREATION AREA

This area would be characterized by planned developments that blend with the northwoods

ecosystem. Architectural style, detailing, and color schemes would blend into and not detract from the natural beauty of the area. Development would be clustered and sensitively placed to minimally disturb the natural landscape. The density of development would be higher than in the previously described management areas but lower than in the urban recreation area.

Natural, social, and built elements all would contribute to the visitor experience. Opportunities still would be available for fishing and seeing wildlife. Opportunities for adventure would be less available than in the previously described areas. This area would provide many opportunities for group experiences. There would often be large numbers of visitors, and the probability of encountering other visitors and land managers would be high. Opportunities for solitude would be low, and noise levels due to visitors might be moderate. Both motorboats and human-powered outdoor recreational activities would be permitted, as long as they could coexist. The area could accommodate a moderate to high level of recreation and/or administrative development. NPS facilities, which would be in clusters and sensitively designed and placed, might include visitor and environmental education centers, interpretive structures, primitive and developed campsites, campgrounds, small and large access points, and administrative structures.

Visitor activities would be more highly structured in the developed recreation area for resource protection and safety purposes. For example, spacial or temporal restrictions might be placed on certain uses such as waterskiing, motorboating, sailing, and fishing to separate these uses and to prevent visitor use conflicts. Resources would be modified for visitor and NPS operational needs and to mitigate and minimize resource impacts due to visitor use.

URBAN RECREATION AREA

In this area, buildings, structures, or the signs of people would dominate the landscape, although natural elements would be present (e.g., the

river). This management area would feel like one is in an upper Midwest city park. The visitor experience would be highly dependent on and shaped by the river and the surrounding built environment, much of which is in private ownership. Most of the developments are commercial, residential, and community facilities. Few or no NPS facilities would be present (e.g., interpretive kiosks might be installed). Opportunities for adventure would not be expected in this management area. This area would lend itself to a social group experience. Many visitors and other people would often be present. There would be relatively few opportunities for solitude, and noise levels, both from visitors and adjacent areas, might be high.

There would be relatively few opportunities to see wildlife, but visitors could still find places to fish. Both nonmotorized uses and motorboats would be permitted in the urban recreation area as long as they could coexist. A relatively high volume of motorboats operating at moderate speeds might be permitted in these areas.

Authorities other than NPS staff would be primarily responsible for managing people and resources. Local government zoning would be the primary regulatory method used to manage structures and buildings. Resources would be modified for visitor needs and to mitigate and minimize resource impacts from visitor use.

TABLE 1: SUMMARY OF THE MANAGEMENT AREA CHARACTERISTICS

AREA CHARACTERISTICS	NEAR-PRIMITIVE NORTHWOODS	NORTHWOODS RECREATION	DEVELOPED RECREATION	URBAN RECREATION
Degree of Naturalness	Very high	High	Moderate	Low
Density of Overall Development	Very low	Low	High	Very high
Type of NPS Development	Primitive campsites, trails, and access points.	Primitive and developed campsites, trails, access points, picnic areas, and small interpretive structures.	Primitive and developed campsites, campgrounds, visitor centers, environmental education centers, interpretive and administrative facilities, and small and large access points.	Small interpretive structures and visitor centers.
Level of Access (numbers and size)	Very low	Medium	High	High
Opportunity for Solitude	High	Medium	Low	Very low
Mode of Travel	Primarily human-powered watercraft and some low-speed motorboats.	Majority of people would use human-powered watercraft, with some low-speed motorboats; occasionally motorboats traveling at moderate speeds might be allowed if they could coexist with other users. However, in the preferred alternative from Nevers Dam to river mile 55 this management area would have a mix of human-powered watercraft and motorboats; motorboats operating at moderate speeds could be accommodated if they could coexist with other users.	Mix of human-powered watercraft and motorboats; motorboats operating at moderate speeds could be accommodated if they could coexist with other users.	Mix of human-powered watercraft and motorboats; motorboats operating at moderate speeds could be accommodated if they could coexist with other users.

THE MANAGEMENT ALTERNATIVES

ALTERNATIVE 1: THE PREFERRED ALTERNATIVE

CONCEPT

The National Park Service would strive to maintain and restore riverway resources while still providing opportunities for low-impact visitor activities. (This alternative is a combination of alternatives A and C that were presented in the March 1996 alternatives workbook.) Most recreational facilities and use levels and patterns would continue to be maintained as they are; some facilities might be modified to be consistent with the management areas in which they occurred.

Proactive management would include establishing objectives, standards, and indicators for resource conditions, as well as for the type and quality of visitor experiences desired along specific stretches of the riverway. Through monitoring those standards and indicators, the National Park Service would help ensure the future preservation of the riverway, as envisioned under this alternative. This management framework would also provide the basis for building partnerships to assist in accomplishing these riverway objectives.

Managing the riverway using the objectives established in the four different management areas would help ensure that a variety of experiences, particularly solitude, quiet, and naturalness, would continue to be found. This would be accomplished by managing a significant portion of the riverway as near-primitive northwoods. The only new facilities that would be allowed would be primitive and/or developed campsites (and the already approved relocation of the Trego visitor center and the correction of the foundation problems at the riverway headquarters noted in the management actions common to all alternatives). However, the number, location, or features of existing facilities might be altered to improve resource

quality or visitor experiences or to address other management concerns.

Canoeing, inner tubing, fishing, hunting, and motorboating, would continue as described in the management area descriptions as long as unacceptable user conflicts and resource impacts did not occur. To resolve user conflicts and/or eliminate resource impacts, management actions such as encouraging use at different times or placing restrictions on visitor use would be implemented if necessary. The National Park Service would consult with the appropriate state department of natural resources before imposing any restrictions on fishing or hunting on the property consistent with authority they have under the law, including sections 35 CFR 1.5, 2.2, and 2.3.

Also, the township of Trego and the St. Croix Chippewa Indians of Wisconsin would be encouraged to provide additional protection to the natural resource, scenic, and aesthetic qualities of areas under their jurisdictions. The National Park Service recognizes the sovereign status of the St. Croix Chippewa Indians of Wisconsin, who's reservation includes lands on the riverway near Danbury. It is the NPS recommended action that these areas be managed by the tribe and the town consistent with conditions that reflect a developed recreation management area.

MANAGEMENT AREAS

The Management Areas: Alternative 1 map shows how the upper riverway would be managed under the preferred alternative. Most of the Upper St. Croix and Namekagon Rivers would be managed under the near-primitive northwoods management area. Two stretches would be managed as northwoods recreation areas: the 0.5-mile St. Croix State Park segment and the upper portion of the Indianhead Flowage

(from the Nevers Dam site to river mile 55, which is about 3 miles above the Taylors Falls dam). The Trego Flowage, the 0.5-mile Riverside stretch, the 1.25-mile Danbury stretch, and the 0.5-mile Highway 70 crossing would be managed as developed recreation areas, and the Hayward Flowage and the lower part of the Indianhead Flowage (from river mile 55 to the Taylors Falls dam) would be designated as urban recreation areas. This alternative would generally maintain existing riverway conditions and uses, and the placement of management areas reflects this.

MANAGING RIVERWAY VISITOR CAPACITY

The National Park Service has long recognized the need to apply the carrying capacity concept in areas under its jurisdiction. The General Authorities Act of 1970 that was amended by the National Parks and Recreation Act of 1978 [Public Law 95-625]) requires that general management plans establish a visitor carrying capacity for each national park system unit. This plan provides a basis for and a management framework to begin to address the upper riverway's carrying capacity.

The National Park Service has developed a visitor experience and resource protection (VERP) framework to address carrying capacity and visitor use impacts on visitor experiences and NPS-managed (park) resources (NPS in process). Under this approach, carrying capacity is defined as the type and level of visitor use that can be accommodated while sustaining resource and social conditions that complement the purposes of a park and its management objectives. In other words, carrying capacity is interpreted not so much as a prescription of numbers of people but as a prescription of visitor experience (social) and natural resource conditions. Under the VERP framework, a park staff, with public input, determines resource conditions and visitor experiences that should be maintained in different parts of a park and sets up a monitoring program to ensure that these experiences and conditions are maintained.

To address carrying capacity, this plan identifies the upper riverway's purposes and significance, describes resource conditions and visitor experiences in management areas, and prescribes general strategies for managing visitor use. There are two more integral elements in the carrying capacity framework that still need to be completed after this general management plan is implemented (also see appendix E for more information on the VERP process):

- (1) key social and natural resource indicators need to be identified and monitored in each management area, which also requires that standards (minimum acceptable conditions) be set for each management area, and
- (2) management actions must be taken if visitor experiences or resource conditions are out of standard or monitoring indicates a downward trend in the condition of the resources or visitor experiences.

More research would be done to differentiate between the different management areas to better specify characteristics and determine when the characteristics of that area have been violated. This research would determine which indicators would best measure different management area characteristics.

Until the above tasks are completed, the riverway staff would monitor visitor use to establish baseline conditions and watch for impact trends. Based on current visitor and resource data, there are no known unacceptable impacts on visitor experiences or resources. However, there are indications that some stretches of the upper riverway are becoming more crowded and congested. For example, on busy weekends visitors are unable to easily find unoccupied campsites on the lower Namekagon. Thus, there is a need to start monitoring visitor use levels and impacts on the upper riverway immediately. Data from this initial monitoring effort would help set a baseline and enable the riverway staff to identify "hot spots" and priorities for future monitoring.



The planning team has identified some provisional social indicators for the upper riverway. Work should begin immediately on monitoring these indicators in selected management areas so a baseline on current use levels and impacts can be developed. The social indicators are as follows:

- change in bare ground within campsites and landings
- amount of litter per mile
- availability of campsites
- congestion at selected put-in and takeout landings

These social indicators would be relatively easy and feasible to monitor, are related to visitor use levels, can significantly affect the visitor experience, and can serve as early warnings of unacceptable impacts that may be occurring.

The planning team did not have information available to identify provisional resource indicators for the upper riverway. Additional study, and possibly research, is needed to identify these indicators.

RIVERWAY ADMINISTRATION AND STAFFING

The National Park Service is proposing an additional 12 permanent and 16 seasonal positions and 1,260,118 (in 1996 dollars) in additional funds to support increased staffing and operational needs. This number is considered to be the minimum needed to adequately administer the upper riverway, protect resources, and provide for quality visitor experiences, as envisioned under this alternative. These needs are more fully presented in appendix F.

ALTERNATIVE 2: ALLOW INCREASED USE

CONCEPT

The National Park Service would allow expanded recreational opportunities on specific

reaches of the riverway while maintaining riverway resources. The existing visitor experience would probably change in some areas along the riverway. (This alternative was presented as alternative B in the March 1996 alternatives workbook.) Any expansion of recreational opportunities and/or any increases in visitor use would be in line with visitor demand; riverway resource conditions would determine limits on how much use could occur in given areas. Exceptional resource values would still be protected, consistent with the upper riverway purposes and significance.

Proactive management would include establishing objectives, standards, and indicators for resource conditions, as well as for the type and quality of visitor experiences desired along specific stretches of the riverway. Through monitoring those standards and indicators, the National Park Service would help ensure the future preservation of the riverway, as envisioned under this alternative. This management framework would also provide the basis for building partnerships to assist in accomplishing these riverway objectives.

Management areas would not necessarily reflect existing use patterns as they would under the preferred alternative (see the Management Areas: Alternative 2 map). Some stretches of the river — particularly from Hayward to Trego and Riverside to river mile 55 — could receive higher volumes of use. This use would be allowed because most of these areas would be managed as northwoods recreation. Areas managed as near-primitive northwoods would retain opportunities for visitors seeking solitude and naturalness on the riverway. Implementing this alternative might result in fewer opportunities for solitude than alternative 1 because fewer areas would be managed as near-primitive northwoods.

Canoeing, inner tubing, fishing, hunting, and motorboating, would continue as described in the management area descriptions as long as unacceptable user conflicts and resource impacts did not occur. To resolve user conflicts and/or eliminate resource impacts, management actions



MANAGEMENT AREAS: ALTERNATIVE 2 ALLOW INCREASED USE

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA

United States Department of the Interior • National Park Service
DSC • 630 • 20016A • 9/96

such as encouraging use at different times or placing restrictions on visitor use would be implemented if necessary. Monitoring activities would be increased to ensure that exceptional resource values would not be degraded as a result of increased use. The National Park Service would consult with the appropriate state department of natural resources before imposing any restrictions on fishing or hunting on the property consistent with authority they have under the law, including sections 35 CFR 1.5, 2.2, and 2.3.

Most NPS facilities (e.g., landings, campsites) would remain; however, if use increases, additional recreational facilities might be provided in the northwoods recreation and developed recreation management areas as long as these facilities did not violate the management areas' characteristics. Preservation partnerships involving the National Park Service, state historic preservation offices, and local groups could help guide the adaptive reuse of historic structures as part of these recreation facilities. In addition to any new development, the Trego visitor center would be relocated and foundation problems at the riverway headquarters would be corrected. Careful site selection for new access points and parking could disperse use and preserve as much feeling of solitude as possible.

The Trego Flowage and the Danbury stretch would be managed as urban instead of developed (as in alternative 1). Because of this difference in management, slightly more development could be allowed near these towns, and town managers would also not be encouraged to provide as much protection to the natural scenic and aesthetic qualities of areas under their jurisdictions, as in alternative 1.

The National Park Service would recommend to the Upper St. Croix Management Commission that one of its policies regarding access under development standards be amended before implementing this alternative (see "Appendix C: Upper St. Croix Management Commission Policy," resolution III D, Development Standards).

MANAGEMENT AREAS

To provide for increased use of the riverway most of the St. Croix from Riverside to the Nevers Dam site, and the Namekagon from Hayward to Trego would be designated as northwoods recreation areas (see the Management Area: Alternative 2 map). The upper reach of the St. Croix (from the Gordon Dam to Riverside), the upper reach of the Namekagon from the Namekagon Dam to the northern edge of the Hayward Flowage, the lower reach of the Namekagon from the Trego flowage to the confluence with the St. Croix, and the 0.5-mile rapids section on the St. Croix near the confluence of the Kettle River by St. Croix State Park would be designated as near-primitive northwoods management areas. Three portions of the St. Croix would be designated as developed recreation management areas: the 0.5-mile Riverside stretch, the 0.5-mile Highway 70 stretch, and the stretch from the Nevers Dam site to river mile 55 (about 3 miles north of the Taylors Falls dam). Urban recreation areas would encompass the Hayward Flowage, Trego Flowage, a 1.25-mile Danbury stretch, and the lower part of the Indianhead Flowage, from river mile 55 to Taylors Falls.

MANAGING RIVERWAY VISITOR CAPACITY

The National Park Service has long recognized the need to apply the carrying capacity concept in areas under its jurisdiction. The General Authorities Act of 1970 that was amended by the National Parks and Recreation Act of 1978 [Public Law 95-625]) requires that general management plans establish a visitor carrying capacity for each national park system unit. This plan provides a basis for and a management framework to begin to address the upper riverway's carrying capacity.

The National Park Service has developed a visitor experience and resource protection (VERP) framework to address carrying capacity and visitor use impacts on visitor experiences and NPS-managed (park) resources (NPS in

process). Under this approach, carrying capacity is defined as the type and level of visitor use that can be accommodated while sustaining resource and social conditions that complement the purposes of a park and its management objectives. In other words, carrying capacity is interpreted not so much as a prescription of numbers of people but as a prescription of visitor experience (social) and natural resource conditions. Under the VERP framework, a park staff, with public input, determines resource conditions and visitor experiences that should be maintained in different parts of a park and sets up a monitoring program to ensure that these experiences and conditions are maintained.

To address carrying capacity, this plan identifies the upper riverway's purposes and significance, describes resource conditions and visitor experiences in management areas, and prescribes general strategies for managing visitor use. There are two more integral elements in the carrying capacity framework that still need to be completed after this general management plan is implemented (also see appendix E for more information on the VERP process):

- (1) key social and natural resource indicators need to be identified and monitored in each management area, which also requires that standards (minimum acceptable conditions) be set for each management area, and
- (2) management actions must be taken if visitor experiences or resource conditions are out of standard or monitoring indicates a downward trend in the condition of the resources or visitor experiences.

More research would be done to differentiate between the different management areas to better specify characteristics and determine when the characteristics of that area have been violated. This research would determine which indicators would best measure different management area characteristics.

Until the above tasks are completed, the riverway staff would monitor visitor use to establish baseline conditions and watch for

impact trends. Based on current visitor and resource data, there are no known unacceptable impacts on visitor experiences or resources. However, there are indications that some stretches of the upper riverway are becoming more crowded and congested. For example, on busy weekends visitors are unable to easily find unoccupied campsites on the lower Namekagon. Thus, there is a need to start monitoring visitor use levels and impacts on the upper riverway immediately. Data from this initial monitoring effort would help set a baseline and enable the riverway staff to identify "hot spots" and priorities for future monitoring.

The planning team has identified some provisional social indicators for the upper riverway. Work should begin immediately on monitoring these indicators in selected management areas so a baseline on current use levels and impacts can be developed. The social indicators are as follows:

- change in bare ground within campsites and landings
- amount of litter per mile
- availability of campsites
- congestion at selected put-in and takeout landings

These social indicators would be relatively easy and feasible to monitor, are related to visitor use levels, can significantly affect the visitor experience, and can serve as early warnings of unacceptable impacts that may be occurring.

The planning team did not have information available to identify provisional resource indicators for the upper riverway. Additional study, and possibly research, is needed to identify these indicators.

RIVERWAY ADMINISTRATION AND STAFFING

The National Park Service is proposing an additional 11 permanent and 18.5 seasonal positions and an additional \$1,265,784 (in 1996 dollars) to support increased staffing and

operational needs. This number is considered to be the minimum needed to adequately administer the upper riverway, protect resources, and provide for quality visitor experiences, as envisioned under this alternative. This alternative would cost slightly more than alternative 1 because of costs associated with increased visitor use and the mitigation of impacts related to increased use. These needs are more fully presented in appendix F.

ALTERNATIVE 3: CONTINUE MANAGEMENT UNDER THE 1976 MASTER PLAN (NO ACTION)

CONCEPT

This alternative is included to satisfy the requirements of the National Environmental Policy Act and to provide a baseline for comparing the other alternatives. (This alternative was presented as alternative D in the March 1996 alternatives workbook.) The National Park Service would continue to manage the riverway as it has in the past, providing developments and services for riverway visitors, and relying on the 1976 *Master Plan* for guidance and direction.¹ Canoeing, fishing, hunting, and other non-motorized activities, as well as motorboat use, would be permitted throughout the riverway. Natural resource management would continue to focus on responding to external pressures (e.g., water pollution), conducting baseline inventories, monitoring resources, and controlling exotics to the extent possible given the limited personnel and funding.

Permitted uses of the riverway might evolve, and no new management actions would be taken to regulate or control uses unless it was determined that they were adversely affecting the upper riverway's exceptional values. No

changes would occur in the upper riverway's visitor and administrative facilities, with the exceptions of the approved relocation of the Trego visitor center and the correction of the problems at the riverway headquarters. Campsites, trails, interpretive facilities, access points, and other recreational facilities also generally would not change, but some might be expanded if use increases. NPS visitor facilities might also be closed or relocated to address resource impacts.

MANAGEMENT AREAS

Management areas would not apply to this alternative, which is a continuation of management under the 1976 *Master Plan*. Therefore, there is no management areas map.

MANAGING RIVERWAY VISITOR CAPACITY

The General Authorities Act for the National Park Service requires that general management plans establish a carrying capacity for the unit. No action would be taken to address visitor carrying capacity unless significant resource or visitor impacts were identified that were inconsistent with the purposes of the upper riverway. If riverway managers and staff determined that unacceptable detrimental changes in resource conditions or visitor experiences were taking place or had taken place, identification and implementation of visitor carrying capacities would be accomplished.

RIVERWAY ADMINISTRATION AND STAFFING

There would likely be no change in current riverway staffing.

1. Minor modifications have been made in the *Master Plan* since it was approved, particularly with regard to proposed developments, but these modifications have not altered the overall intent of the 1976 plan or the National Park Service's general management of the upper riverway. The modifications in the *Master Plan* are documented in the riverway's files at St. Croix Falls.

TABLE 2: SUMMARY OF THE KEY DIFFERENCES BETWEEN THE ALTERNATIVES.

	ALTERNATIVE 1: PREFERRED ALTERNATIVE	ALTERNATIVE 2	ALTERNATIVE 3: NO ACTION
Overall Management Direction	Maintain and restore riverway resources while still providing opportunities for low-impact visitor activities.	Allow expanded recreational opportunities on specific reaches of the riverway while maintaining riverway resources.	Manage the riverway as directed by the 1976 <i>Master Plan</i> , providing developments and services needed to serve riverway visitors.
Resource Management Emphasis	Maintain and improve resource quality, diversity, and integrity while also mitigating impacts of visitors and impacts coming from sources outside the riverway.	Same as alternative 1, but more emphasis on the proactive mitigation of impacts due to increased visitor use.	Same as alternative 1, but fewer management tools would be available.
Visitor Experience	Maintain visitor experiences, with continued opportunities for solitude, quiet, and naturalness.	Retain opportunities for visitors seeking quiet, solitude, and naturalness on specific riverway reaches while also increasing opportunities for motorized and nonmotorized uses on other reaches.	The riverway would be managed to meet changing visitor demands and increasing use levels as much as possible.
Opportunities for Different Uses	Continue opportunities for motorized and nonmotorized activities as described for the management area as long as user conflicts and resource impacts could be minimized.	Same as the preferred alternative, except there would be more opportunities for motorized surface-water use and fewer opportunities for solitude.	Opportunities for motorized and nonmotorized surface-water activities throughout the riverway would continue as long there were no adverse impacts on significant resources. Over time there might be fewer opportunities for solitude.
Access	Maintain access levels, but move or alter accesses if needed to improve resource quality or the visitor experience or to address other management concerns.	Maintain most access points; if use increases, these access points might be expanded in number and size to increase access to various stretches of the riverway.	Maintain most existing access points; some access points might be expanded in number and size if use levels increase.
River Mileage in Different Management Areas (%)	84% near-primitive 4% northwoods recreation 6% developed recreation 5% urban recreation	43% near-primitive 42% northwoods recreation 6% developed recreation 9% urban recreation	Not applicable
Administration and Staffing	Additional 12 permanent and 16 seasonal positions and \$1,260,118 in additional funds would be needed to support these staffing and operating needs.	Additional 11 permanent and 18.5 seasonal positions and \$1,265,784 in additional funds would be needed to support these staffing and operating needs.	No change from existing staff of 23 permanent and 26 part-time or seasonal field operation or management positions and 8 permanent clerical and administrative support positions, most of which address responsibilities for both the upper and lower riverway.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED FURTHER

Two alternatives presented in the March 1996 alternatives workbook were considered but not analyzed further. These were alternative A (which maintained existing resource conditions and visitor experiences) and alternative C (which emphasized the protection of riverway resources). The workbook also presented alternative B (which is synonymous with alternative 2 in this document) and alternative D (which is synonymous with alternative 3 in this document). The decision to not further analyze alternatives A and C was made because alternative 1 in this document is a combination of the workbook's alternatives A and C. The similarities between the workbook's alternatives A, C, and alternative 1 in this document were far greater than the differences. These similarities and differences are outlined below.

The differences between the management areas of alternative 1 in this plan and the workbook's alternative A were the Hayward to Trego reach, the Trego Flowage, and Danbury. All other riverway sections were to be managed the same under both alternatives. In the workbook's alternative A, the Hayward to Trego reach was zoned northwoods recreation to reflect current conditions, which include high use by inner tubers (which decreases the amount of solitude for other visitors), the amount of rural development visible from the river (which decreases the degree of naturalness), and more residential and vehicle noise that is audible along this stretch. In alternative 1 in this document this reach would be managed as near-primitive northwoods to be consistent with the management strategies desired for these areas in the future. In the workbook's alternative A the Trego Flowage and Danbury were to be managed urban recreation to allow development, similar to the Hayward area. In alternative 1 in this document, the Trego Flowage and Danbury would be managed as developed recreation in the hopes that future development would be planned to blend into the natural environment.

The difference between the management areas in alternative 1 in this plan and the workbook's alternative C was from Nevers Dam to river mile 55. In the workbook's alternative C this reach was to be managed as near-primitive to reflect the very limited amount of development along the predominantly federally owned and managed area. In alternative 1 in this document this reach would be managed as northwoods to accommodate motorboat activity in the deeper waters along this reach. All other riverway sections were zoned the same under both alternatives.

The differences in the overall management philosophies between alternative 1 in this document and the workbook's alternatives A and C were also minor. The workbook's alternative A maintained visitor use levels at the 1995 level; alternative 1 in this document generally maintains visitor numbers at this level but allows management area characteristics to guide the distribution of use. The workbook's alternative C focused primarily on resource protection with some disadvantages to visitor use; alternative 1 in this document still has a strong environmental philosophy but balances it with more use on some sections of the riverway.

There are more similarities than differences between alternative 1 in this document and alternatives A and C in the workbook. Therefore, only alternative 1 is fully analyzed with a complete environmental analysis in this document. If all three alternatives had been analyzed, the impact analysis would have been so similar that it would have been difficult to distinguish between the three. By presenting and fully analyzing in this document alternatives 1 (which is a combination of the workbook's alternatives A and C), alternative 2 (which is synonymous with the workbook's alternative B), and alternative 3 (which is synonymous with the workbook's alternative D) the public is still being provided with the required reasonable range of alternatives to consider. It also results in a shorter and more understandable document.



AFFECTED ENVIRONMENT

THE ST. CROIX RIVERWAY AND ITS ENVIRONS

NATURAL SCENIC RESOURCES AND VISITOR EXPERIENCES

The most impressive asset of the river is the environment through which it flows. The upper riverway corridor has a relatively natural appearance for much of its length, with the major exceptions of the towns of Hayward, Trego, and St. Croix Falls/Taylors Falls. Aside from the towns, bridge and utility line crossings, several dams, and scattered residences, the activities and signs of people are not seen or heard from the rivers. The diverse forest communities along the rivers, from the drier jack pine forests to lush marshlands, provide an attractive landscape. When the hardwoods turn color in autumn, a brilliant mosaic of yellows and reds attracts many visitors. Plentiful opportunities for observing wildlife also add to the appeal of the area.

The visual character of the upper riverway changes dramatically, from narrow closed-in gentle streams to fast-flowing rapids, from lake-like stretches, to wide, meandering rivers. The following paragraphs generally describe the landscapes visitors see along the different reaches of the riverway:

Rapids on the St. Croix are mostly class I; however, some class II rapids occur on certain stretches. As defined in the international scale of river difficulty class I refers to moving water with a few riffles and small waves with few or no obstructions. Class II refers to easy rapids with waves up to 3 feet, and wide, clear channels that are obvious without scouting. Some maneuvering may be required in class II rapids.

LAKE NAMEKAGON TO HIGHWAY 63 (CABLE WAYSIDE)

This portion of the upper Namekagon River seems wild and primitive. There is little evidence of people. The river here is narrow and

intimate, with a relatively steep gradient. It seems much more streamlike than riverlike. The river shifts from flowing slowly through calm pools to flowing rapidly over rocky and gravelly areas. It is shallow, except in the spring, making this part of the river difficult to canoe or navigate. Low water volumes and numerous beaver dams sometimes make it necessary to walk a canoe along stretches in the summer. The river cuts a tunnel through spruce, fir, and hardwood woodlands, and the twists and turns of the river provide only constrained views. Fishing is not particularly noteworthy in this area. Parts of this segment do not freeze or form only thin ice, which limits opportunities for winter recreational use.

HIGHWAY 63 (CABLE WAYSIDE) TO HAYWARD

This stretch of the Namekagon is still relatively flat and narrow, but the river has more water because of the inflow of numerous springs and streams. River travel is possible most of the summer, and various length trips are available. Many rocks and riffles are present. The river flows through a gently rolling landscape, covered primarily by birch and aspen with some cedar and white pine. The views here are still fairly confined. The river seems less primitive than the above section because the Namekagon is crossed by several bridges and nearby residences are more visible and audible. Several old logging dams are also present. Quality trout fishing can be found along this stretch. This stretch of the river usually does not have suitable ice for winter activities.

HAYWARD FLOWAGE (AIRPORT ROAD TO TRAILER PARK ROAD)

In this flowage the river feels more like a lake than a river. The Namekagon has been artificially impounded, and the water surface is

wider than on adjacent stretches. The current is imperceptible, and the water is usually fairly deep. The terrain along the river is gently rolling. The landscape is urban, with a lot of shoreline development and little forest to screen dwellings. The view is generally more open than on other parts of the upper riverway with little sense of enclosure. The flowage is wide and deep enough to support various recreational uses. Good fishing opportunities exist. During winter, most of the flowage freezes and has snow levels suitable for winter recreation.

HAYWARD TO TREGO

This part of the Namekagon is part of a broad outwash plain, with sandy soils and some wetlands/marshes. The sandy banks lend themselves to camping. Jack pine and aspen are predominant along the river, with a minor component of red pine. The woods along the river limit views from the river, although one can see up and downstream. The Namekagon is moving at a moderate speed down a fairly steep gradient, and a variety of riffles and rapids that are easily navigable by most river travelers are present. The water is deeper here than in the upper sections, which permits river travel all summer. Highway noise and residential development are encountered along the riverbanks. There are good fishing opportunities for smallmouth bass. In the winter the ice on this stretch is usually not suitable for winter recreational activities.

TREGO FLOWAGE (RAILROAD BRIDGE TO NSP DAM)

This flowage is similar to Hayward except it feels more rural in character. Both natural and human elements are evident along this part of the riverway. The artificial impoundments create in places broader expanses of water surface than the adjacent river. The current is negligible, and the water is deep in places. The shores have a mix of forested areas and rural development such as cottages, residences, and resorts. In many cases, development is well screened by

vegetation. Broad expanses of flat water make the areas feel more open and provide sweeping vistas. Like Hayward, this flowage can support opportunities for a variety of recreational uses. Good fishing opportunities are available. During winter, most of the flowage freezes and has snow levels suitable for winter recreation.

TREGO TO RIVERSIDE, INCLUDING THE ST. CROIX UP TO THE CCC BRIDGE

The Namekagon and St. Croix are broader here, but still offer an intimate experience. After the Namekagon joins the St. Croix, the river widens. The rivers are flowing at a moderate speed, water depth is relatively shallow, and water flows are dependable all summer long — river travel is possible all summer by canoes. One feels fairly enclosed on the river, with the river's sinuous character and adjacent forests limiting views. The river flows through a landscape that is gently rolling to flat, with fairly high sandy banks. The area feels relatively natural, with very few signs of human habitation. Many opportunities exist for high-quality camping and canoeing. Good opportunities exist for fishing, including muskie fishing. The Namekagon usually does not freeze sufficiently for winter recreational use.

GORDON DAM TO CCC BRIDGE

Unlike other portions of the upper riverway, the terrain along this portion of the St. Croix is rocky, and bedrock is frequently visible. Rapids and rock gardens are frequently encountered in the river, and there is a noticeable current. The river is fairly straight and of moderate width compared to the rest of the upper riverway. Good canoeing and conditions are limited to high water (in spring or after heavy rainfall in the summer). Wetlands are common, and bottomland hardwood forests (e.g., silver and sugar maple, ash, aspen, and cedar) cover the rolling lands adjacent to the river. The forests and a lack of development and noise along the riverbanks provide a feeling of being enclosed in a primitive, wild northwoods setting. Because of

the extensive wetlands adjacent to the river, few quality camping areas can be found. The river's cool water provides opportunities for small-mouth bass fishing. During the winter the ice is usually variable and unsafe for winter recreational activities.

RIVERSIDE TO RAPIDS

Below Riverside the St. Croix is basically a stretch of wide bends, with many low-lying islands of varying size that add to the feeling of intimacy and diversity. This reach has a moderate gradient and several class I rapids. Sandbars are common. The river is wider compared to the stretch above the confluence, and it is fairly shallow with occasional pools. River travel is possible throughout the summer by canoes and small motorized watercraft, but propeller-driven craft will have difficulty navigating many areas during periods of low water. Most of the adjacent terrain is fairly flat, but occasionally there are terrace escarpments. Low riverbanks, swamps, and other wetlands are common; good campsites are not common on this stretch. The primary vegetative cover is bottomland hardwoods (e.g., silver maple and ash) and oak-pine, with some pockets of aspen-birch and swamp hardwoods (e.g., black spruce and white cedar). The woods limit views of the adjacent lands. Almost no shoreline development or noise is encountered. Good fishing opportunities exist for muskie, smallmouth bass, and channel catfish. This stretch of the river is usually frozen in the winter, and there is ample snow for winter recreational activities.

RAPIDS

The St. Croix separates into two parallel channels in this segment. The main channel of the St. Croix is fairly wide, with a relatively large number of islands. It has a steep gradient and fast current. This segment provides opportunities for excitement and adventure throughout the summer. Short reaches of class I rapids are present along the main channel, some of which can change to class II depending on conditions. Relatively deep pools can be found interspersed

between the rapids. In contrast to the main channel, the Kettle River slough (channel) on the Minnesota side of the main channel is narrower, shallower, and somewhat slower — although there are some short class I rapids in this channel. During low water, canoe travel through the slough is arduous because of rocky obstructions. The adjacent land is rocky and relatively flat, covered predominantly by bottomland hardwoods. In contrast, terrace escarpments are more prominent on the Wisconsin side, and the vegetation is predominantly oak-pine woods. Both sides also have pockets of aspen-birch, and the Wisconsin side has pockets of swamp hardwoods. The woods throughout this stretch of the river limit views of the adjacent landscape. There is very little visible development, and the sound of the rapids generally drowns out other noise. Good fishing opportunities exist for channel catfish, smallmouth bass, and walleye. The rapids always have some open water during the winter. However, the slough may freeze, depending on conditions, and with ample snow can be used by snowmobiles with caution.

RAPIDS TO UPPER TAYLORS FALLS FLOWAGE (NEVERS DAM SITE)

This stretch of the St. Croix averages more than 400 feet wide, is relatively shallow, and has both long straight parts and wide bends. Islands of varying size are scattered throughout the stretch. From Sunrise to Taylors Falls there also are sandy beaches along the river. There is a moderate current, and there are many riffles; however, there are no rapids with standing waves. River travel is possible throughout the summer by canoes; small motorized watercraft will have difficulty navigating some stretches during periods of low water. Most of the adjacent land is relatively flat, although several prominent sandstone cliffs occur along the shore. A combination of bottomland and upland hardwoods, oak-pine, and lowland and upland brush grow along the riverbanks. Pine plantation pockets are also present. Woods usually limit views in the upper half of this stretch, but some old fields provide opportunities for expansive

views of the surrounding river valley. In the lower half of this stretch, the river is wider and valley bluffs are higher, which often enables one to see sweeping views of the valley from the river. Limited shoreline development is visible or audible in this area, which makes the area still feel natural. Good opportunities exist for fishing for catfish, smallmouth bass, and walleye. Most of the river surface is frozen in the winter, but water sandwiched between the ice and snow is often present in places and is a safety concern for snowmobilers. Snow levels are ample for winter recreational activities.

UPPER TAYLORS FALLS FLOWAGE (NEVERS DAM SITE TO RIVER MILE 55)

The landscape in this section is more rural in character than the lower Taylors Falls Flowage. The view from the river is generally more open, with mixed hardwood forest on the banks and bluffs broken by open pastures and farmsteads. This flowage is wide and deep enough to support various recreational uses. Good fishing opportunities exist. During the winter, most of the flowage freezes and suitable snow levels exist for winter recreation.

LOWER TAYLORS FALLS FLOWAGE (RIVER MILE 55 TO TAYLORS FALLS DAM)

Impounded by a dam constructed in 1906, the St. Croix River resembles a lake in this section. The terrain along the river ranges from gently rolling to pronounced bluffs. Unlike other portions of the river, there is a lot of shoreline development and large numbers of people may be present. Roads and urban residential development are apparent from the river. This flowage is wide enough and deep enough to support a variety of recreational opportunities. A commercial marina and a launch ramp at the Lions Club Park in St. Croix Falls provide ready access.

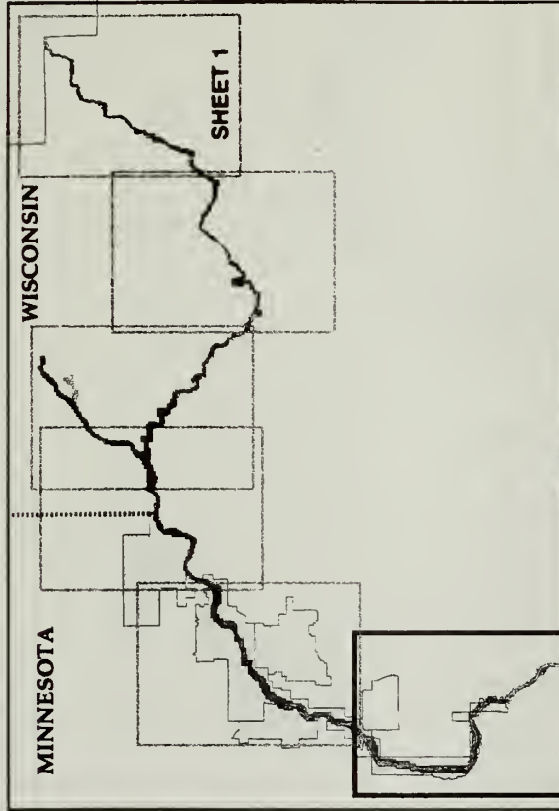
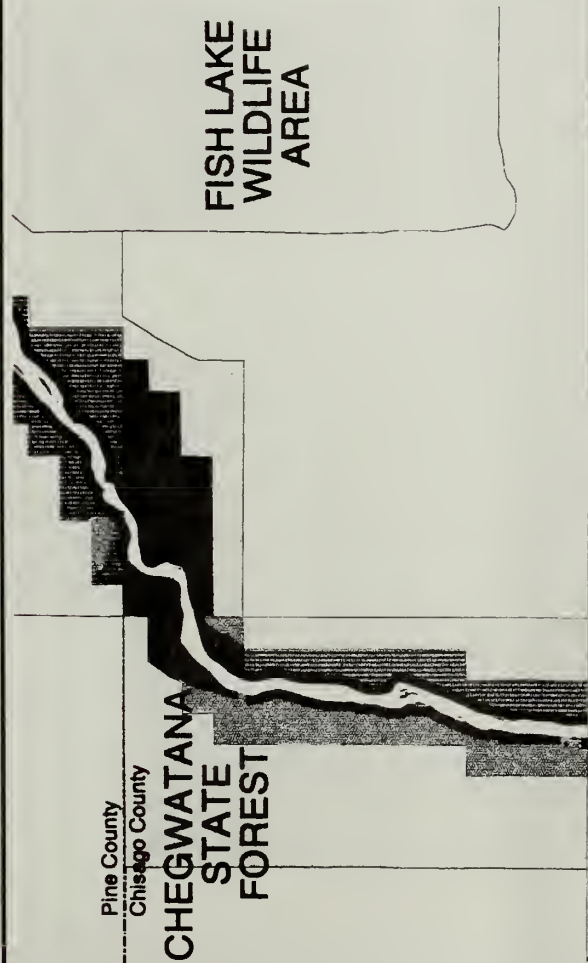
LAND AND WATER STATUS







The Wild and Scenic Rivers Act states that the total acreage within the boundaries of rivers in the system is limited to an average of not more than 320 acres of land per linear mile on both sides of the river. This means that the upper riverway, which includes approximately 200 river miles, may include no more than 64,000 acres of all types of public and private interests in lands within its boundaries. The boundary averages 0.25 mile on either side of the river. Congress may legislate exceptions to this 320 acres per mile rule, as it did in the 1980 public law 96-580 amendment that added 1,380 acres (referred to as the Velie Estate) to the riverway (see appendix A).

The statutory limitations on total acreage were later clarified in an amendment to the Wild and Scenic Rivers Act to mean that the average of 320 acres per mile was to be measured from the ordinary high-water mark on both sides of the river. Therefore, the acreage in the riverbeds and islands, both of which are within the perimeters of the ordinary high-water marks on each side of the river, do not count against the 320-acre limitation. The complex and time-consuming job of calculating riverbed acreage has yet to be completed, and only that which has been calculated has been added to the total upper riverway acreage. A conservative estimate of the total riverbed and island acreage would be more than 48,000 acres.

Therefore, under the current legislation the gross riverway acreage could include the 64,000 acres as allowed in the Wild and Scenic Rivers Act, the 1,380 acres in the Velie Estate provided for in the amendment, and the estimated 48,000 acres of riverbeds and islands for a total of as much as 113,000 acres. However, the current authorized boundary for the Upper St. Croix National Scenic Riverway is quoted at only 67,653 acres until more of the riverbed and island acreage can be calculated.

The total acreage in the riverway is currently subdivided into the following types of land interests. Landownership throughout the upper riverway is shown on the following six maps.

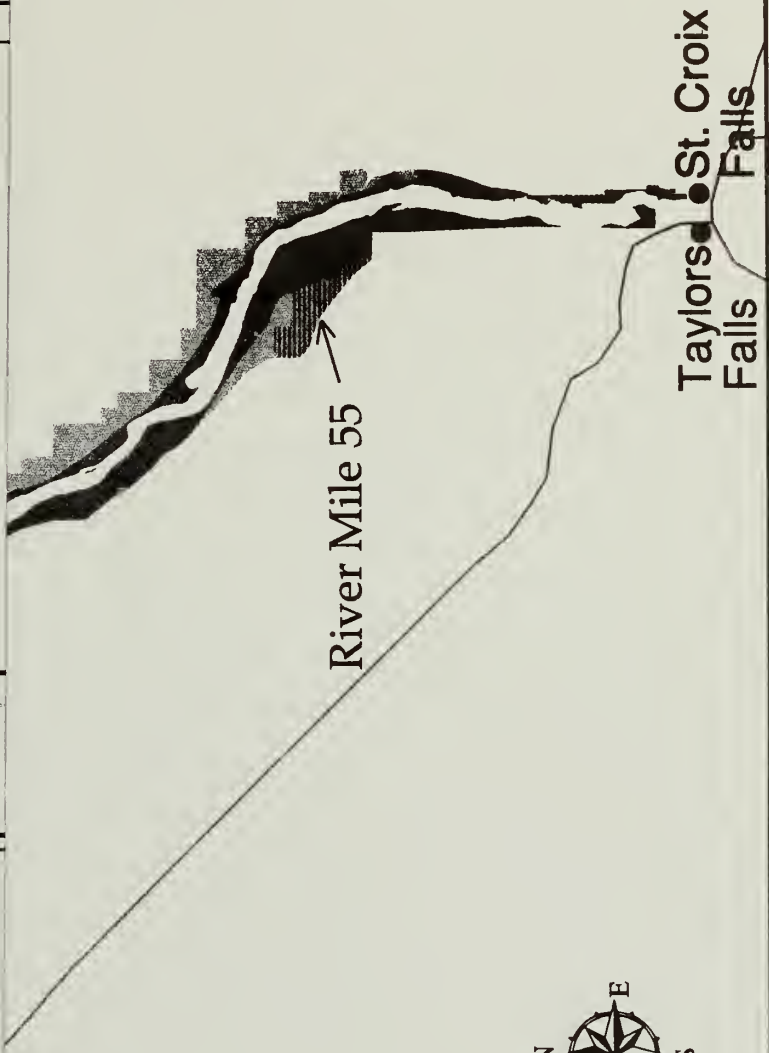


-  NPS Fee Title
-  Private Ownership with NPS Scenic / Riverfront Easement
-  Other Public Ownership
-  Private Ownership, Acquisition Deferred
-  Private Ownership, Protection Program Not Complete
-  Public Lands Outside of Riverway Boundary



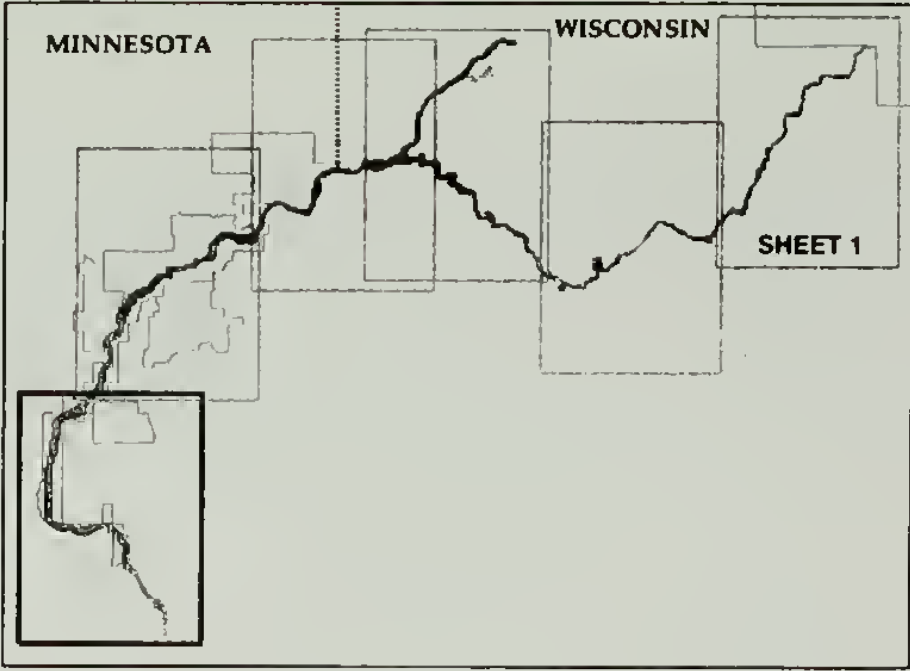
LANDOWNERSHIP: Sheet 1 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
 WISCONSIN • MINNESOTA
 United States Department of the Interior • National Park Service
 DSC • 630 • 20019 • 4/97



Pine County
Chisago County
**CHEGWATANA
STATE
FOREST**

**FISH LAKE
WILDLIFE
AREA**



Burnett County
Polk County

WISCONSIN

**GOVERNOR
KNOWLES
STATE FOREST**

**ST. CROIX
WILD RIVER STATE PARK**

Nevers Dam Site

MINNESOTA

95

St. Croix River

River Mile 55

- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary

1 0 1 2 3 Miles

LANDOWNERSHIP: Sheet 1 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA
United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97



Taylors Falls • St. Croix Falls

Minnesota

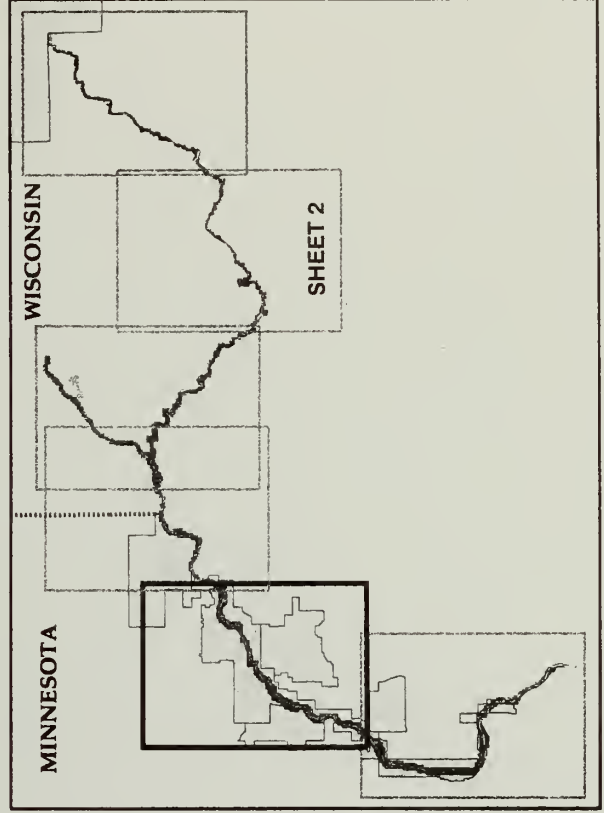
FISH LAKE WILDLIFE AREA

- NPS Fee Title**
- Private Ownership with NPS Scenic / Riverfront Easement
 - Other Public Ownership
 - Private Ownership, Acquisition Deferred
 - Private Ownership, Protection Program Not Complete
 - Public Lands Outside of Riverway Boundary



LANDOWNERSHIP: Sheet 2 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA
United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97



Minnesota

ST. CROIX
STATE PARK

GOVERNOR
KNOWLES
STATE FOREST

St. Croix River

Rapids

CHENGWATANA
STATE FOREST

CREX MEADOWS
WILDLIFE AREA

Wisconsin

Highway 70 Stretch

Grantsburg

70

48

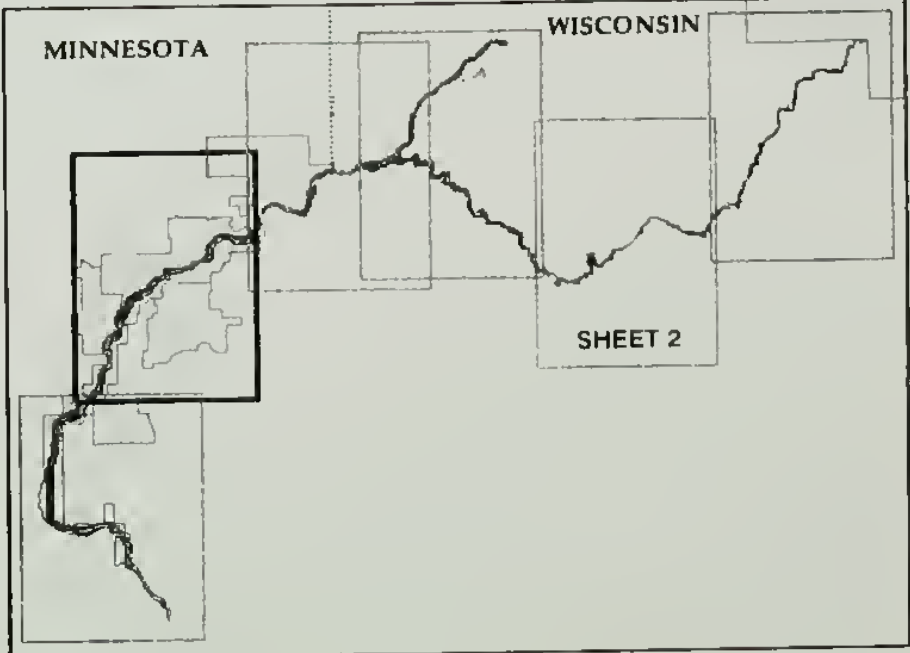
FISH LAKE
WILDLIFE AREA

- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary

1 0 1 2 3 Miles

LANDOWNERSHIP: Sheet 2 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA
United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97









Minnesota

Wisconsin

Dairy Land

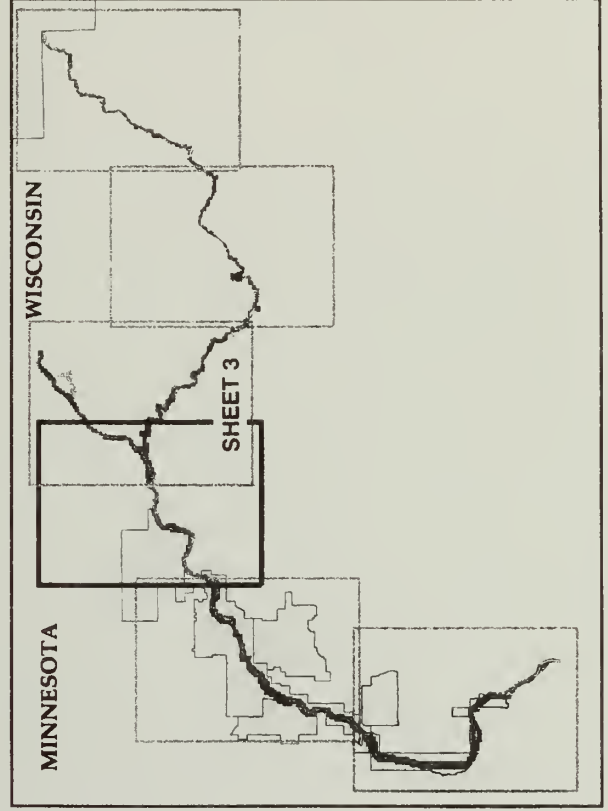
35

-  NPS Fee Title
-  Private Ownership with NPS Scenic / Riverfront Easement
-  Other Public Ownership
-  Private Ownership, Acquisition Deferred
-  Private Ownership, Protection Program Not Complete
-  Public Lands Outside of Riverway Boundary



LANDOWNERSHIP: Sheet 3 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA
United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97



Minnesota

Wisconsin

Dairy Land

35

Cozy Corner

Douglas County

Burnett County

ST. CROIX STATE FOREST

St. Croix River

Riverside Stretch

Danbury Stretch

48

Danbury

35

77

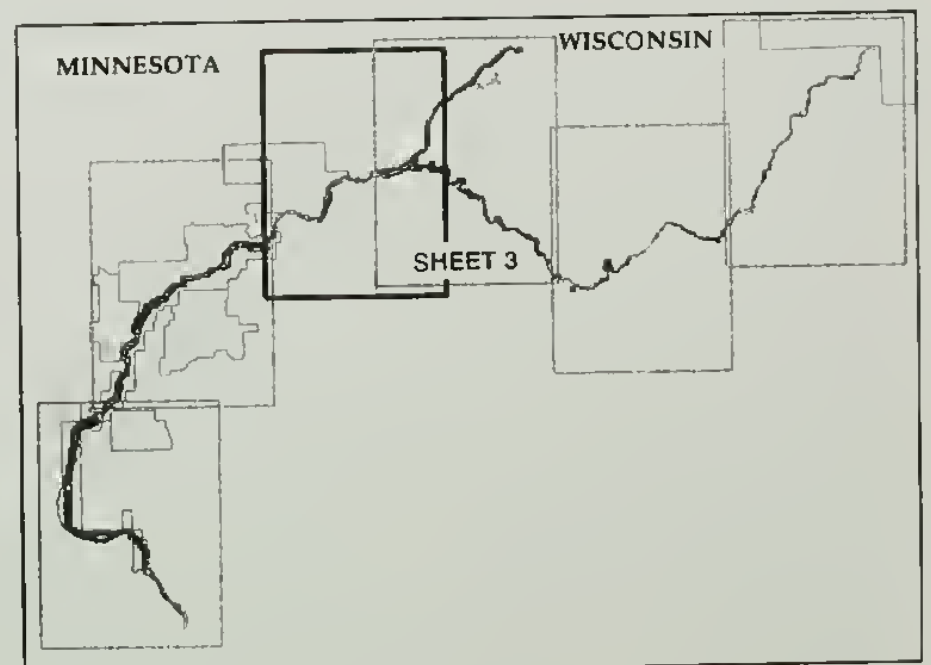
- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary

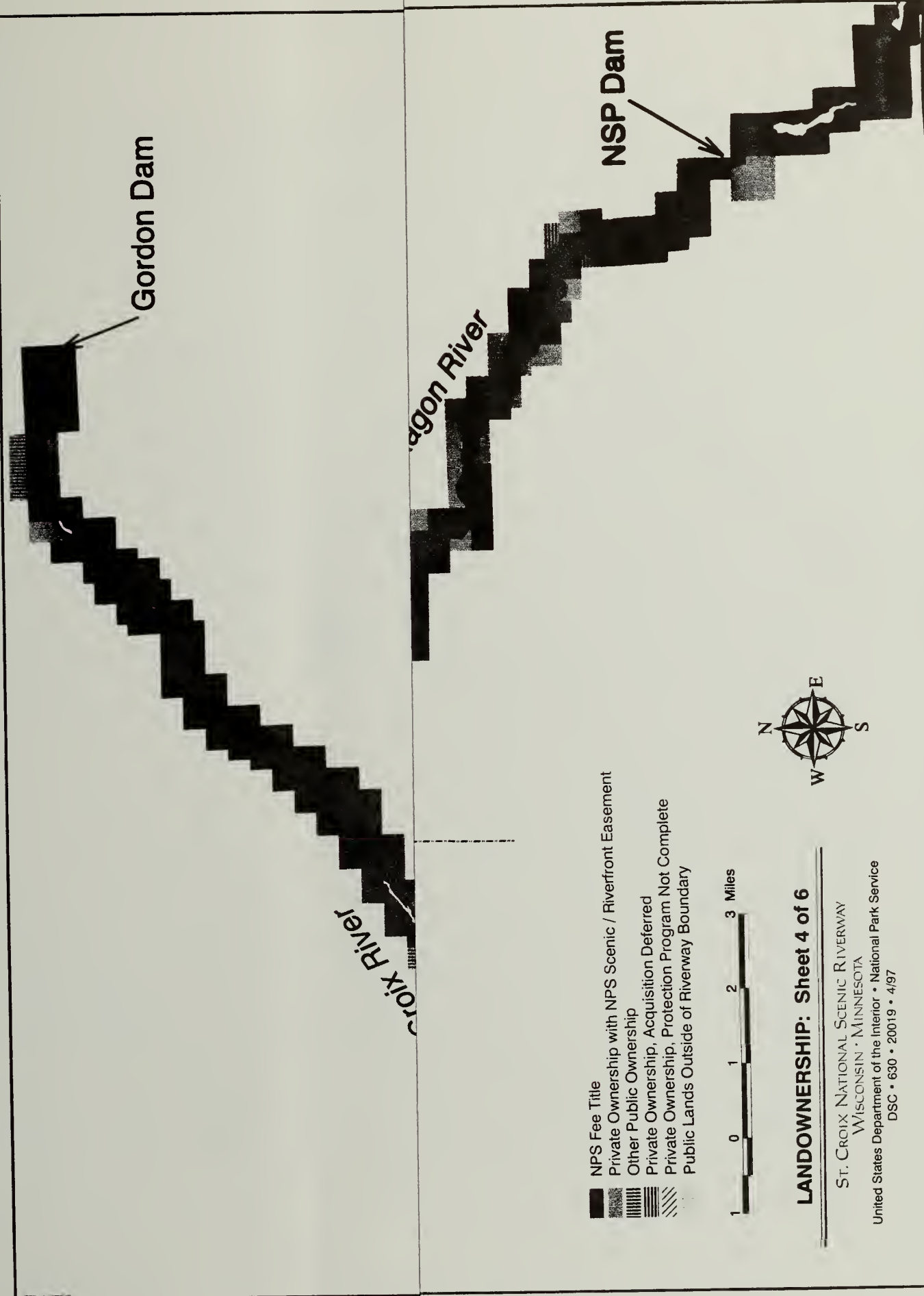
1 0 1 2 3 Miles

LANDOWNERSHIP: Sheet 3 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN · MINNESOTA

United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97





- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary

1 0 1 2 3 Miles

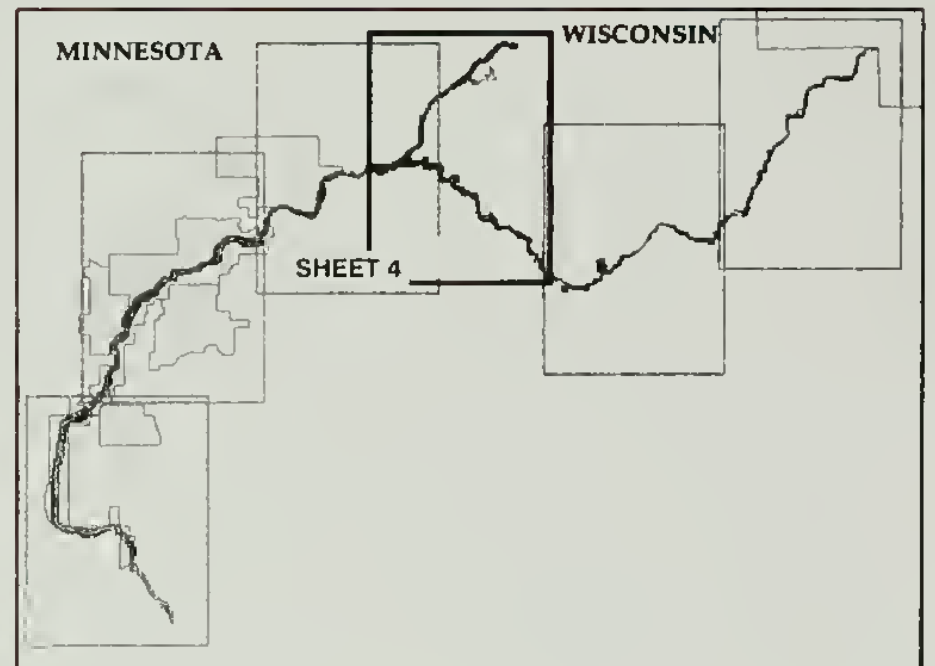


LANDOWNERSHIP: Sheet 4 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA
United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97

St. Croix River

Gordon Dam



Douglas County

Burnett County

Washburn County

77

Namekagon River

NSP Dam

- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary

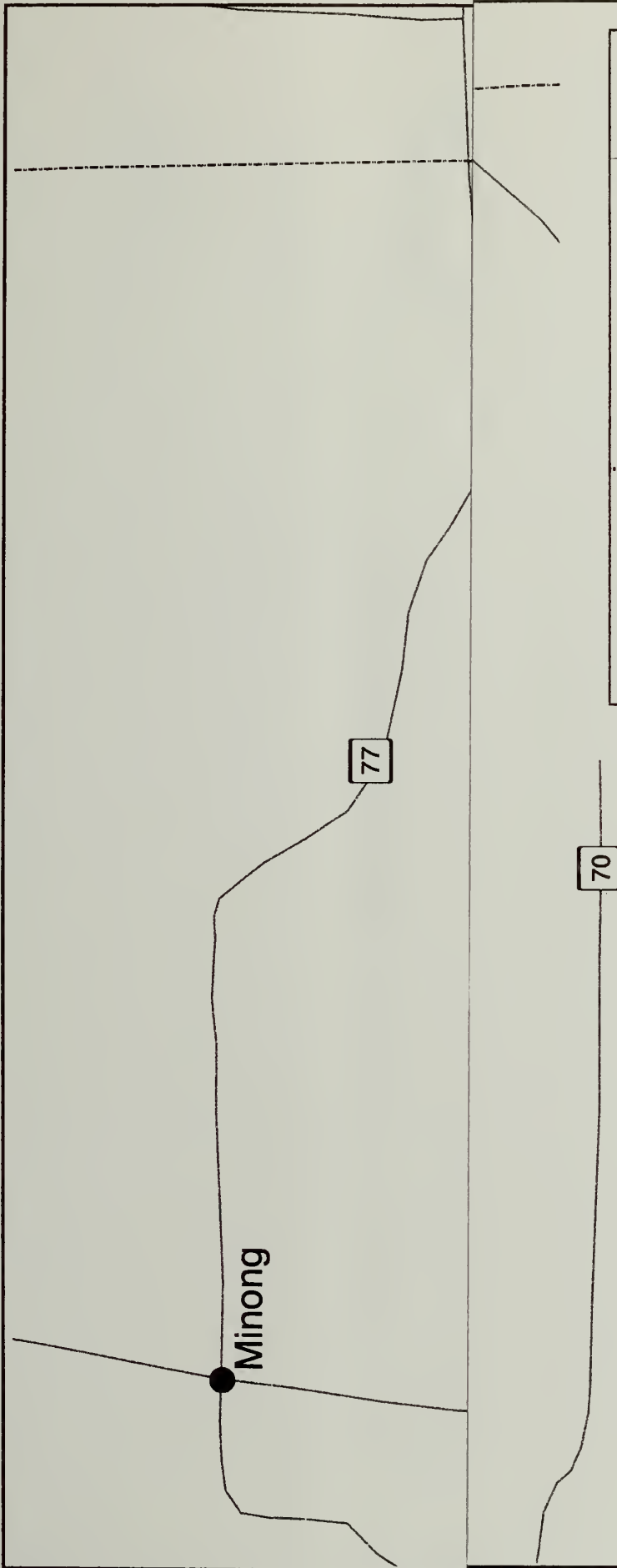
1 0 1 2 3 Miles

LANDOWNERSHIP: Sheet 4 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA

United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97



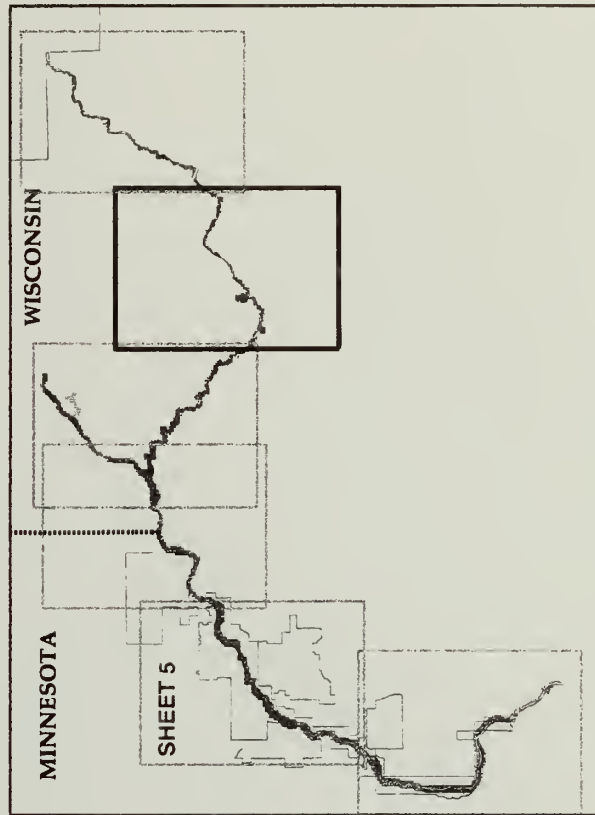


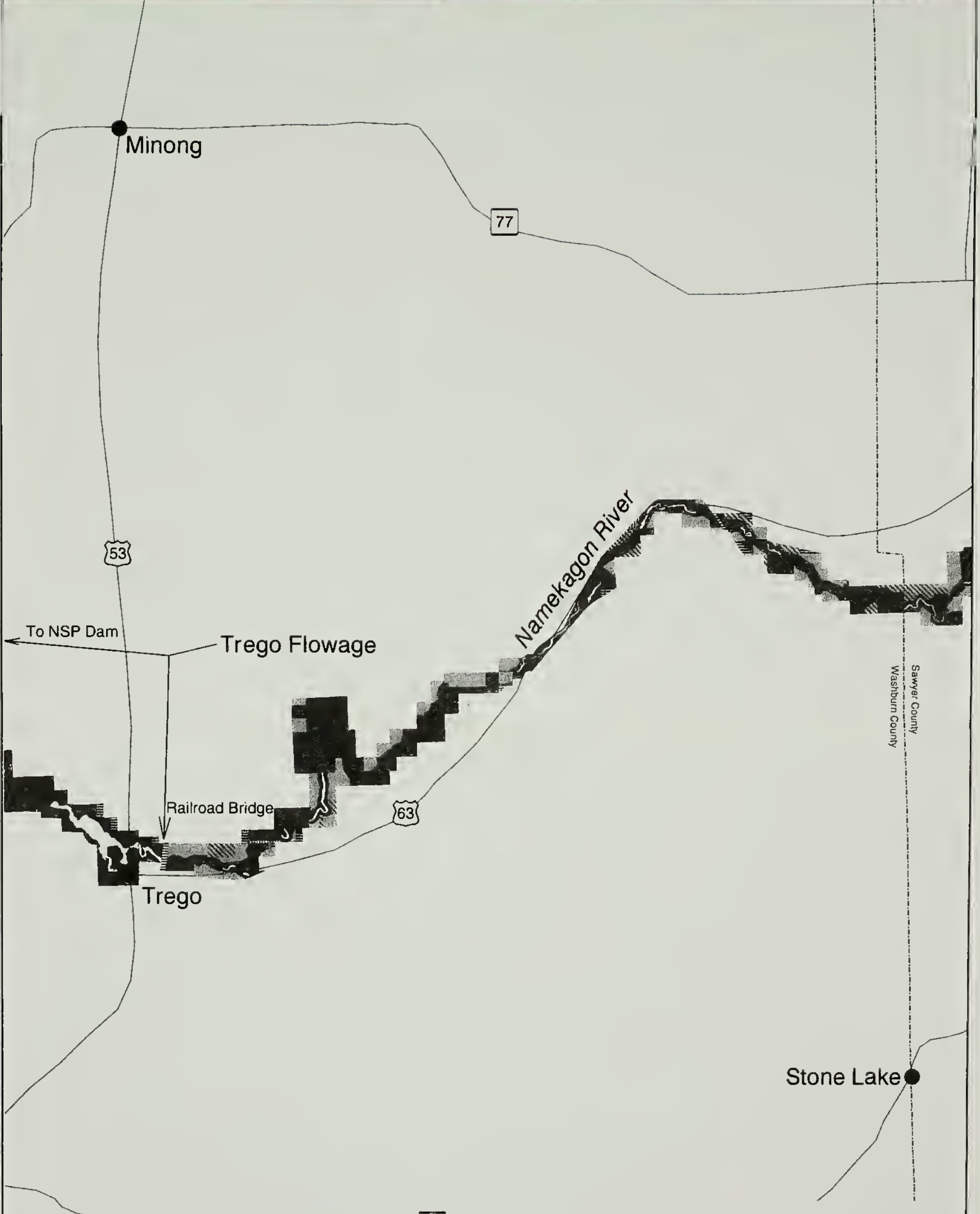
- NPS Fee Title**
- Private Ownership with NPS Scenic / Riverfront Easement
 - Other Public Ownership
 - Private Ownership, Acquisition Deferred
 - Private Ownership, Protection Program Not Complete
 - Public Lands Outside of Riverway Boundary









LANDOWNERSHIP: Sheet 5 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
 WISCONSIN • MINNESOTA
 United States Department of the Interior • National Park Service
 DSC • 630 • 20019 • 4/97



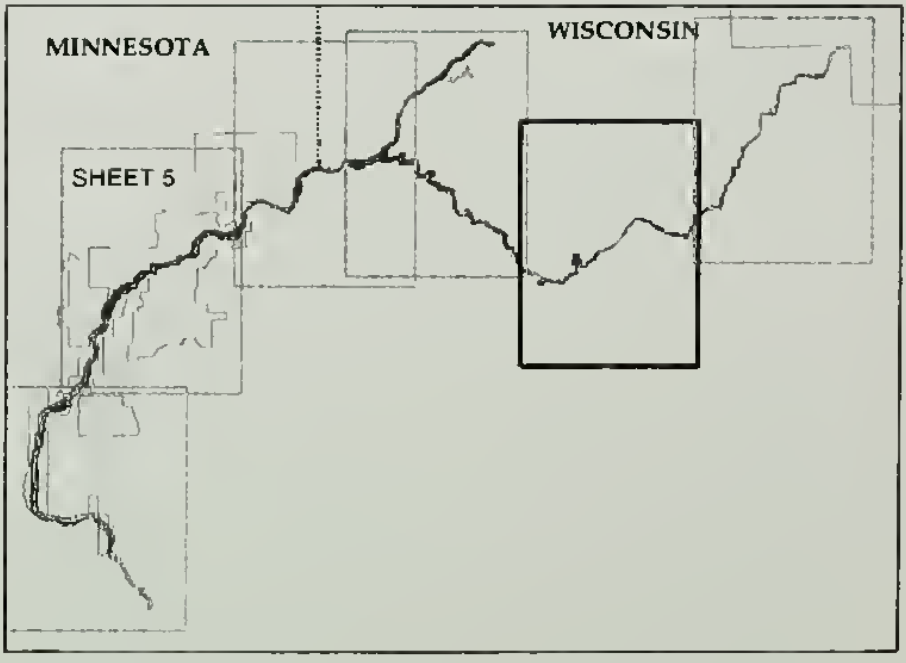


-  NPS Fee Title
-  Private Ownership with NPS Scenic / Riverfront Easement
-  Other Public Ownership
-  Private Ownership, Acquisition Deferred
-  Private Ownership, Protection Program Not Complete
-  Public Lands Outside of Riverway Boundary

1 0 1 2 3 Miles

LANDOWNERSHIP: Sheet 5 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
 WISCONSIN · MINNESOTA
 United States Department of the Interior · National Park Service
 DSC · 630 · 20019 · 4/97



CHEQUEMEGON
NATIONAL
FOREST

Namekagon Dam



Trailer Park Road

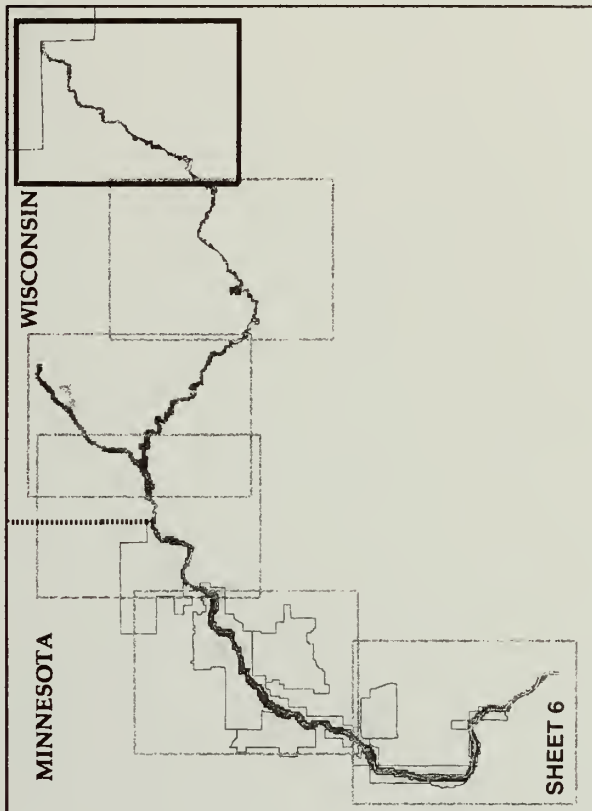


- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary



LANDOWNERSHIP: Sheet 6 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA
United States Department of the Interior • National Park Service
DSC • 630 • 20019 • 4/97



CHEQUEMEGON
NATIONAL
FOREST

Namekagon Dam

Bayfield County
Sawyer County

Namekagon River

Hayward

Airport Road

Hayward Flowage

Trailer Park Road

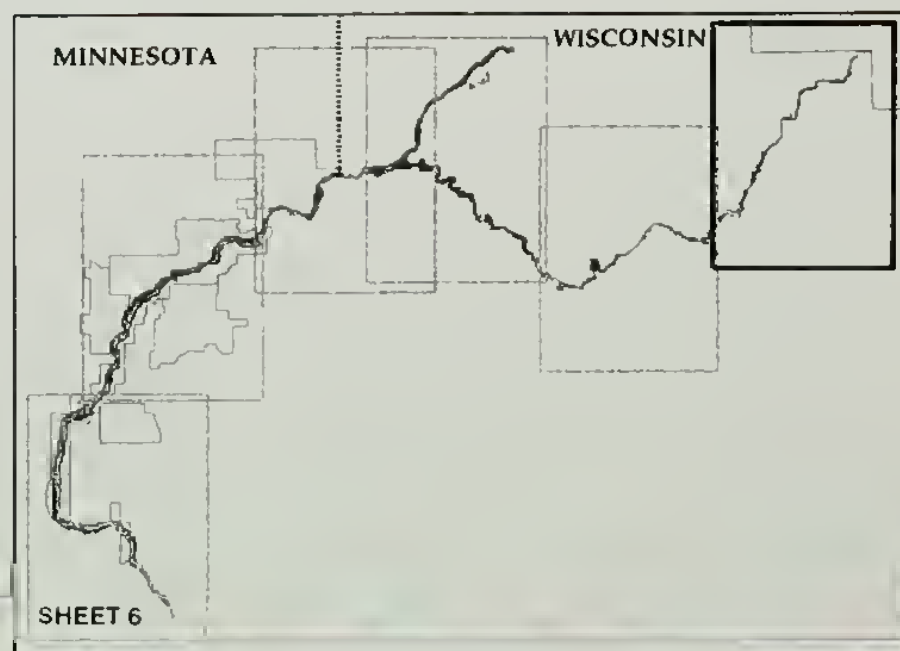
- NPS Fee Title
- Private Ownership with NPS Scenic / Riverfront Easement
- Other Public Ownership
- Private Ownership, Acquisition Deferred
- Private Ownership, Protection Program Not Complete
- Public Lands Outside of Riverway Boundary

1 0 1 2 3 Miles

LANDOWNERSHIP: Sheet 6 of 6

ST. CROIX NATIONAL SCENIC RIVERWAY
WISCONSIN • MINNESOTA

United States Department of the Interior • National Park Service
OSC • 630 • 20019 • 4/97



NPS FEE TITLE (ABOUT 20,850 ACRES)

Fee title means total ownership or absolute title to the land, subject to certain acceptable title conditions, as set in the riverway's legislation. The Wild and Scenic Rivers Act limits the federal acquisition of fee title land to no more than an average of 100 acres per mile outside the ordinary high water marks, or a total of 20,000 acres in the riverway. Included in the fee acreage acquired to date are all of the individual reservations of use and occupancy that the former owners chose at the time fee title was acquired by the National Park Service (as provided for in the act). Most of these reservations of use are for a fixed period of years, usually the maximum of 25; however, some are for the lifetime of the reservation holder(s). Currently there are about 115 such reservations, all of which will end automatically on the scheduled expiration date.

The statutory limitation on fee acreage also does not apply to the acreage of riverbeds and islands within the ordinary high-water marks on each side of the river. Under Wisconsin law, the riparian (riverbank) owner is also the fee owner of the riverbed, to the center or thread of the stream. Therefore, the 3,400 acres of Wisconsin riverbed identified to date and the 195 acres of islands, both of which are now included in the 20,850-acre figure of NPS fee title lands, must be deducted to arrive at an accurate net fee acreage. For Minnesota riverbed status, see "Other Public Ownership" section below.

PRIVATE OWNERSHIP WITH NPS SCENIC/ RIVERFRONT EASEMENT (ABOUT 10,216 ACRES)

These easement interests are less-than-fee interests with the underlying or servient fee interests being privately owned and still on the public tax rolls. Scenic/riverfront easements are purchased to protect the scenic qualities of the riverway, as envisioned in the Wild and Scenic Rivers Act. Both easements permit existing, legal land uses to continue forever. The current 375 scenic easements (9,626 acres) do not give the public any right to enter on or use the land,

but they do permit limited, single-family type development on lots that are out of sight from the river and have at least 1.5 acres of land and at least 250 feet of frontage on the side facing the river. The 22 riverfront easements (590 acres) are actually a form of scenic easement, but with river frontage; development of these tracts is essentially frozen at the stage that existed at the time of acquisition. A few of these easements give the public some very limited use of a portion of the river frontage, if the main tract is undeveloped.

OTHER PUBLIC OWNERSHIP (ABOUT 31,533 ACRES)

This category includes public ownerships other than those under NPS jurisdiction, including other federal (U.S. Forest Service and Bureau of Indian Affairs), state, county, township, city, village and school district ownerships and other similar entities. In Minnesota the state holds fee title to the riverbed in trust for the public, regardless of the identity of the riparian owner. Therefore, as the riverbed acreage is calculated in Minnesota it will be added to the other public ownership acreage total. NPS acquisition of any of these lands in other public ownership will only be pursued if the owner proposes a use that is adverse to riverway policies or the owner plans to offer the property as surplus for sale to private owners.

PRIVATE OWNERSHIP, ACQUISITION DEFERRED (ABOUT 3,582 ACRES)

These 218 tracts are privately owned and for the most part are within incorporated or otherwise acceptably zoned areas (as described in the Wild and Scenic Rivers Act). No protective acquisition of interests on these properties will be undertaken unless there should be an adverse change in zoning or other controls. A few of these private tracts are at the exterior of the riverway boundary, and even if development should occur it would not affect the riverway's natural scenic resources. Most of these exterior tracts will be removed from the riverway at some future date in an accumulative boundary change.

PRIVATE OWNERSHIP, PROTECTION PROGRAM NOT COMPLETE (ABOUT 1,682 ACRES)

To protect significant riverway resources and complete the approved land protection program, the National Park Service would like to acquire scenic easement interests on specific sensitive properties. There are 93 such privately owned tracts in Burnett, Washburn, Douglas, Sawyer, and Bayfield Counties in northwest Wisconsin. All are scheduled for acquisition of a protective scenic easement interest. These easements will be acquired in the regular manner, if and when additional funds become available.

RIGHTS-OF-WAY AND OTHER TYPES OF EASEMENT INTERESTS (NO SPECIFIC ACREAGE ASSIGNED)

Within the riverway boundary are numerous and varied types of rights-of-way and access easements, none of which have any acreage assigned specifically to them because their acreage is already included in another category. Therefore, they are not separated out as an acreage total. For more specific information about land and water status, please refer to the riverway's *Land Protection Plan*.

JURISDICTION

The United States currently exercises proprietary jurisdiction over the riverway. All applicable state and local ordinances apply. Water surface jurisdiction is shared by states, the National Park Service, the U. S. Corps of Engineers, and the U. S. Coast Guard. The latter two apply because both the St. Croix and Namekagon Rivers are considered to be navigable by state and federal regulations. The National Park Service recognizes the sovereign status of the St.

Croix Chippewa Indians of Wisconsin, who's reservation includes lands on the riverway near Danbury.

THE WATERSHED

Located in northwestern Wisconsin and eastern Minnesota, the St. Croix River is a major tributary of the Mississippi River. Beginning in Upper St. Croix Lake near Solon Springs, Wisconsin (elevation 1,016 feet, from USGS topographic maps dated 1971–83), the St. Croix flows 154 miles southwesterly and then southerly to join the Mississippi at Prescott, Wisconsin (elevation 675 feet) (NPS 1976a; 1976b). The upper 25 miles of the river are entirely within Wisconsin, and the remaining 129 miles form the boundary between Wisconsin and Minnesota. Approximately 102 miles of the upper river are within the boundaries of the Upper St. Croix National Scenic Riverway (NPS 1976a). The watershed encompasses 4,828 square miles in nine counties in Wisconsin and 2,932 square miles in 10 counties in Minnesota (MWBAC 1994). In the counties bordering the St. Croix River system there are numerous lakes and streams; in the entire basin there are 1,770 tributary streams, 98 of which drain directly into the St. Croix mainstem, and 628 lakes (≥ 0.4 ha surface area) that are on the St. Croix or connected directly to a tributary system (Fago and Hatch 1993).

The St. Croix's principal tributaries are the Namekagon, Yellow, Clam, Kettle, Snake, Wood, Sunrise, Trade, Apple, Willow, and Kinnickinnic Rivers. All of these tributaries, except the Apple River, flow into the St. Croix upstream of Taylors Falls. The entire Namekagon River is in Wisconsin. Starting at Lake Namekagon, about 15 miles east of Cable, the Namekagon runs for 98 miles, generally south and west, to its confluence with the St. Croix. The principal tributary of the Namekagon is the Totagatic River.

NATURAL RESOURCES

CLIMATE

The climate of the St. Croix basin is humid continental. The area is influenced by both cool and dry continental air masses from the north and moist air masses from the Gulf of Mexico. The weather is characterized by warm, humid summers and cold winters. The average annual temperature in the Upper St. Croix area is 42°F. Temperatures during the year vary considerably, ranging from an average of 11°F in January to 71°F in July. Early spring months are cool and rainy, with June usually being the wettest month of the year. During summer and early fall, the weather becomes progressively drier. Total annual precipitation varies from 34 inches in the northeastern portion of the St. Croix basin to 29 inches in the east-central area. Snowfall contributes about 15% of the total annual precipitation; annual snowfall averages about 45 inches per year in the St. Croix basin, most of which occurs in February and March. The growing season for the St. Croix basin varies considerably depending on the location, averaging about 120 days between frosts. The rivers are usually frozen from November until April.

AIR QUALITY

The Upper St. Croix Riverway is considered an area of relatively clean air. Under the provisions of the Clean Air Act (42 U.S.C. 7401 et seq.), the riverway is designated as a class II clean air area. Under this designation, limited development can be permitted in the vicinity of the riverway as long as the levels of particulate matter, sulfur dioxide, and nitrogen dioxide do not exceed the class II increments (maximum allowable increases).

Unless otherwise indicated, the information included in this chapter applies to the Upper St. Croix and Namekagon Rivers. The text differentiates between the upper riverway and the entire St. Croix Riverway and the St. Croix basin or watershed.

The Upper St. Croix Riverway is in an airshed that meets all primary and secondary national ambient air quality standards. Air quality and visibility are usually excellent, with little evidence of pollution. The upper riverway's distance from major population centers, the low level of industry in the region, and the relatively low visitation rates all help minimize air pollution.

Another indicator of the upper riverway's air quality may be provided by lichens. Some lichens are sensitive to low levels of various atmospheric pollutants. A 1988–90 study conducted by Wetmore (1991) concluded that there is no evidence of lichens being damaged by air pollution in the northern part of the riverway. Lichens analysis did not show abnormal accumulations of pollutants at most of the northern localities. A high sulfur level was found by the Namekagon Dam. Although Wetmore provided no explanation for this reading, it was probably due to emissions from a large pressboard manufacturing plant in Hayward (see below).

Although air quality and visibility are usually good in the Upper St. Croix and Namekagon area, smoke from wood-burning stoves is occasionally noticeable in local communities, particularly under adverse weather conditions (i.e., stagnant air or inversions). Also, there is one major stationary source, the nation's largest pressboard manufacturing plant, adjacent to the Namekagon in Hayward, Wisconsin. In 1994 the plant agreed to upgrade its gaseous emission controls under a stipulation from the Wisconsin Department of Natural Resources. The plant is also under a department compliance schedule to install state-of-the-art particulate emission controls.

NOISE

Noise levels have not been measured in the upper riverway. Although noise levels are relatively quiet for large portions of the riverway, sounds of people and machinery can be heard in

localized areas. The main noise source on the upper riverway is motor vehicles. Motor vehicles generate noise along those sections of the riverway that are close to roads and highways. In particular, noise from automobiles, trucks, and buses can be heard on U.S. Highway 63 where it follows, crosses, and recrosses the Namekagon River between Trego and Cable. Motor vehicle noise can also be heard by riverway users at other road crossings (e.g., Wisconsin Highway 77, County Highway M, County K, U.S. Highway 53, and Minnesota Highways 35, 70, 77, and 48).

There are a few points along the rivers where noise is more evident than on other stretches. Noise from a variety of sources is evident when the Namekagon passes through the towns of Hayward and Trego. These sounds include traffic, pets, people shouting, etc. The Hayward airport also generates noise that can be heard by river users. Depending on wind direction, noise from the Louisiana Pacific and Johnson Timber wood processing plants near Hayward can be heard along the Namekagon.

Motorboats, personal watercraft, and snowmobiles are relatively infrequent noise sources on the upper riverway. In the flowages noise from outboard motors and an occasional personal watercraft can be heard in the summer. During the winter months snowmobiling in the area generates some noise. Snowmobile trails help channel this type of noise along specific corridors. In particular, trail crossings on Highway M, the Namekagon Trail, and County Route O are areas where snowmobiles can be heard. Also, snowmobiles occasionally can be heard driving up the river from St. Croix Falls to Highway 35 (Riverside).

Other sources that contribute noise to a limited extent along the rivers include summer use of trail bikes, chain saws, aircraft, and agricultural and logging machinery.

PHYSIOGRAPHY AND TOPOGRAPHY

All of the St. Croix River above Taylors Falls and the Namekagon River are in one ecoregion described by the U.S. Forest Service (1995). The Laurentian Mixed Forest Province is characterized as a mixture of deciduous and coniferous forests covering an area of low relief, with rolling hills in many places. Lakes, wetlands, morainal hills, outwash plains, and other glacial features are common in this ecoregion.

The Upper St. Croix River is 102 miles long, from the Gordon Dam to the dam at St. Croix Falls, Wisconsin. The river drops from an elevation of 1,016 feet to 750 feet, with an average gradient of 2.6 feet per mile. Thus, much of the St. Croix is a flat water river. However, the gradient varies considerably along the river; the maximum gradient is approximately 8.3 feet per mile at the Kettle River rapids, while the gradient is nearly zero in the St. Croix Flowage (NPS 1976b). There are numerous class I rapids on the river, mostly above the Snake River confluence. Numerous islands, of varying size, are present along the river. One large island, called Big Island, is just below the confluence with the Namekagon. This island is approximately 500 acres in size and rises 100 feet above the river.

The St. Croix becomes progressively wider downstream. The narrowest river segment, about 100 feet, is just above the County T Bridge; the widest segment of the Upper St. Croix is about 1,250 feet at the St. Croix Falls Flowage. The water depth is more than 40 feet in the flowage. The land along the river is mostly flat to gently rolling outwash plain. At its upstream end the terrain is gently rolling, with occasional high sandy banks. Below the Kettle River, small knolls and level terraces appear, the result of flooding in the past. Banks average 8 to 15 feet high along this part of the river. At the lower end of the riverway the St. Croix Falls Flowage (reservoir) stretches for about 11 miles upriver from the dam at St. Croix Falls and partially fills a valley that is 0.5 mile wide.

The Namekagon River is 98 miles long from the Lake Namekagon dam to the confluence with the St. Croix River. The river flows from 1,400 feet down to 900 feet, with an average gradient of 5.1 feet per mile. Forty-two rapids and numerous small islands are spread out along the Namekagon. The river is dammed at several locations, forming the Trego Flowage, Lake Hayward, Phipps Flowage, and Pacwawong Flowage. The Namekagon is fairly narrow at its upper end, with some stretches being 30 feet wide, widening up to an average of 200 feet near its confluence with the St. Croix. The land is mostly flat to gently rolling outwash plain. High banks are also present; on the lower Namekagon banks range up to 80 feet high, with slopes up to 35 degrees.

GEOLOGY

AREA GEOLOGIC FORMATION

Volcanic flows, seas, glaciers, and flowing water have all shaped the landscape of the Upper St. Croix and Namekagon Rivers. The bedrock of this region consists of volcanic and sedimentary rocks that are about 1.1 billion years old from the middle of the Proterozoic eon). These rocks were deposited in a split in the earth's crust extending from Lake Superior southwest to Kansas, called the Midcontinent Rift system. The rifting event formed a synclinal basin, bounded by major faults. The basin was initially filled with basalt from numerous volcanic lava flows, followed by sandstone and shale laid down by streams and lakes (Gary N. Meyer, MN Geological Survey, pers. comm.). These rocks were subsequently covered by Cambrian sandstones and shales deposited by the sea that advanced into the area from the south 570 to 500 million years ago. Differential erosion of the relatively soft middle Proterozoic and Cambrian sandstones and shales led to the formation of the St. Croix and Lake Superior basins. Most of the bedrock layers in the St. Croix basin are covered by several hundred feet of glacial till and outwash, but in some areas the rivers have cut down to and exposed bedrock, such as in the Kettle River rapids.

The current lowland topography along the two rivers is largely the result of glacial activity and the erosional power of water. The St. Croix and Lake Superior basins helped funnel glaciers into the region during the Pleistocene epoch, beginning more than 1.5 million years ago. The St. Croix basin was covered many times by ice sheets during the Pleistocene. The most recent glaciation in the area was the Late Wisconsin, some 35,000 to 10,000 years ago. The Superior lobe, glacial ice moving south out of the Lake Superior basin, covered most of the riverway area at different times during this period. The final ice advance, the Grantsburg sublobe, came from the southwest and covered part of the riverway area in the Grantsburg, Wisconsin, area. Meltwater from these extensive ice sheets created large, temporary lakes.

The Upper St. Croix Valley was formed by glacial rivers that drained these glacial lakes. As the Superior lobe retreated, glacial Lake Nemadji was formed. This lake drained through the Kettle and St. Croix Rivers. Later, glacial Lake Nemadji joined with glacial Lake Brule to form glacial Lake Duluth, which drained into the St. Croix River. Glacial St. Croix River scoured a deep valley through basalt and sedimentary rocks, which is now partially filled with fluvial sediment.

As the ice sheet retreated further, sediments carried by runoff were deposited on the lands along the watercourses. This "outwash" contained sands and fine gravels. Further melting relieved the earth's crust of pressure from the ice. This allowed the crust to rise and eventually resulted in the splitting of the St. Croix into two rivers: the St. Croix to the south and the Brule to the north, with Solon Springs as the divide between the two.

Because of igneous rock outcrops, the St. Croix and Namekagon Rivers tend to be shallow streams with mostly inorganic bottom types ranging from sand to boulder and ledge rock. The main stream bottoms are largely sand. Boulders and cobble occur at the smaller rapids and along shorelines exposed to swift current. Boulders and exposed bedrock predominate in the Kettle Rapids areas of the St. Croix. Soft,

organic muds are found in the St. Croix Falls reservoir but are not common in the shoal waters.

The St. Croix and Namekagon Rivers today are continuing to shape and alter the landscape of the riverway. Human-caused erosion is also occurring in places, particularly on the Namekagon from Trego to the confluence with the St. Croix. In this area visitors climb and slide down the high sand banks, eroding the steeper slopes. (Some of the above information is from personal communication with Gary Meyer of the Minnesota Geological Survey.)

MINERALS

There is private mineral ownership within the upper riverway's boundaries. However, the development potential or economic feasibility of developing any metals in the upper riverway and local watersheds is very low or nonexistent. (Judy Geniac, NPS Geologic Resources Division, pers. comm.) Lands within the riverway under easement are not available for mineral, sand, or gravel mining.

The middle Proterozoic volcanic deposits of the Keweenawan supergroup that underlie the glacial drift, outcrop infrequently in the St. Croix River valley. These formations are a southerly extension of deposits in Michigan that have been mined for copper ores for more than a century. Early explorations in the St. Croix River area produced only trace amounts of copper, but it is possible that mineable quantities exist.

Interest has developed recently in the hydrocarbon potential of the Midcontinent Rift system (Dickas 1986). With a significant increase in the price of oil, exploration activities could be initiated in those portions of the rift that are filled with sedimentary rocks, including parts of the St. Croix and Namekagon watersheds (Gary N. Meyer, MN Geological Survey, pers. comm.).

Sand and gravel deposits exist throughout the valley in the outwash plains. Sand and gravel are being extracted within the upper riverway

boundary and on adjacent lands. One sand and gravel pit is currently operating on private lands adjacent to the St. Croix on the Wisconsin side of Highway 70. Future development of sand and gravel on private lands within and adjacent to the upper riverway is considered likely. Sediment delivered from tributaries is also a concern from both a water quality and channel morphology standpoint (Gary Meyer, MN Geological Survey and Judy Geniac, NPS Geologic Resources Division, pers. com.).

SOILS

No systematic, up-to-date soil surveys exist for most of the Upper St. Croix and Namekagon Rivers. However, detailed soil surveys were published for Chisago County, Minnesota, in 1995 and for Polk County, Wisconsin, in 1979. A soil survey of part of the St. Croix National Scenic Riverway from Big Island to the Nevers Dam site was completed in 1971 by the Soil Conservation Service (now the Natural Resources Conservation Service). Soil surveys are being conducted by the Natural Resources Conservation Service in Burnett, Douglas, Washburn, Bayfield, and Sawyer Counties in Wisconsin.

Most of the soils along the St. Croix and Namekagon River basins formed in material laid down by glaciers. Some soils also formed from organic material, while others formed from alluvium. In general, the soils of the St. Croix basin are primarily silt and sandy loam (Hole 1976 as cited in Graczyk 1986).

Soils on the Wisconsin side of the Upper St. Croix River and along the Namekagon River formed primarily in glacial outwash, and a small portion formed in glacial till. (The Wisconsin soils information was provided by D. Hvizdak, NCRS, Spooner, WI.) From St. Croix Falls north to the Nevers Dam site the soil association is Rosholt-Cromwell-Menahga, which includes well-drained loamy and sandy soils formed in glacial outwash. From the Nevers Dam site north to the Gordon Dam, the soil association is primarily Omega-Nymore, which include excessively drained soils formed in sandy glacial

outwash. However, from Danbury to around Riverside in Burnett County, the soils formed in both sandy outwash and glacial till (Nymore-Sarona association).

Along the Namekagon River from the St. Croix River confluence to Cable, the soil associations include Nymore-Mahtomedi-Grettum-Graycalm and Vilas-Sayner-Karlin-Padus, which are primarily well-drained to excessively drained soils that formed in sandy outwash, some with a thin loamy mantle. From Cable to Lake Namekagon the soil association is Padus-Keweenaw-Sarona, which include well-drained loamy and sandy soils that formed in either outwash or till.

Both the Upper St. Croix and Namekagon River bottoms include alluvial soils (Fordum-Moquah and Evart-Winterfield associations) and organic soils (Seelyeveille-Cathro-Markey association). Igneous rock and sandstone are exposed in various locations along the Upper St. Croix River but are absent along the Namekagon.

The soils on the Minnesota side of the Upper St. Croix also tended to form in alluvium, glacial outwash, and glacial till along the riverway, and they are mostly sandy. In Chisago County most of the soil associations along the Upper St. Croix are from the Fordum-Caryville, Nymore-Lino, and Mahtomedi-Pomroy associations (NCRS 1995). Along the river's floodplain the Fordum-Caryville soils are loamy and sandy soils that formed in alluvial deposits. They range from very poorly drained to well-drained soils. On the uplands the Nymo-Lino soils formed in glacial outwash and are excessively drained and somewhat poorly drained, sandy soils. The Mahtomedi-Pomroy soils also occur on uplands and formed in glacial outwash or in glacial outwash and the underlying glacial till. They are excessively drained and well-drained, sandy soils. Another soil association, the Milaca-Ronneby, occurs in a few areas along the river. These loamy soils formed in glacial till, are well-drained to somewhat poorly drained, and occur on uplands. There are also large areas of peat deposits along the riverway. No current soil information exists for Pine County, but soils along the St. Croix are probably similar to those

in Chisago County (Mark Diers, NCRS, Duluth, pers. comm.).

PRIME AND UNIQUE AGRICULTURAL SOILS

As noted above, detailed soil surveys have not been completed for much of the Upper St. Croix National Scenic Riverway. In Wisconsin, small areas of prime farmland have been identified between St. Croix Falls and the Nevers Dam. These areas consist primarily of Rosholt soils, which are well-drained, loamy soils. No prime or unique agricultural soils are known north of the Nevers Dam or on the Namekagon River because of the sandy soils that occur along the St. Croix and Namekagon Rivers (D. Hvizdak, NCRS, pers. comm.).

On the Minnesota side of the Upper St. Croix a few small patches of prime agricultural soils (i.e., Halder sandy loam [where drained], Novak silt loam, and Siren silt loam [where artificially drained] have been identified in and above Wild River State Park, at the northeast tip of Chisago County (NCRS 1995). No prime or unique agricultural soils are known to occur along the St. Croix in Pine County (Dave Hvizdak of NCRS in Wisconsin and Mark Diers of NCRS in Minnesota, pers. comm.).

WATER RESOURCES

Runoff within the St. Croix basin varies according to soil moisture content, vegetative cover, soil permeability, land slope, depth to water table, and frequency and duration of precipitation. Runoff averages can range from a low of 5 inches per year in the southwest portion of the basin to as much as 15 inches in the northeast. The overall average for the basin is approximately 9.4 inches per year (USGS 1994).

Maximum flows in the St. Croix generally occur in April, May, or June, while minimum flows are usually recorded in December, January, or February. Spring floods generally result from rapid snow melt, with occasional concurrent rainfall of long duration. The maximum re-

corded flow was 54,900 cubic feet per second (cfs) on May 8, 1950 at St. Croix Falls, while the minimum recorded flow was 75 cfs on July 17, 1910 (USGS 1994). The average annual flow is 4,331 cfs at the USGS gauge at St. Croix Falls. At the same location, the daily mean discharge equals or exceeds approximately 2,710 cfs 50% of the time; 90% of the time the river flow exceeds 1,550 cfs (USGS 1994).

Flows in both the Namekagon and the St. Croix are affected by dams within and outside the riverway. The dam at Gordon is a "run of the river" operation, where inflow is generally equal to the outflow and there is a minor effect on flows. The hydroelectric dams at Trego, Hayward, and St. Croix Falls produce fluctuating flows in the rivers downstream, and fluctuating levels in the flowages. During peaking operations at Trego and Hayward there is a slight reduction of flow in the Namekagon River. Outside of the riverway, dams near Danbury on the Yellow River also affect water levels in the Upper St. Croix.

WATER QUALITY

The Upper St. Croix and Namekagon Rivers are generally considered to have high water quality. To help protect that quality, all of the upper riverway has been designated by Wisconsin as "outstanding resource water" and as "outstanding resource value waters – restricted" by Minnesota. Under the Wisconsin classification, a proposed new discharge or an increased discharge from a municipal or industrial source would not be permitted unless the effluent meets the background water quality level in the river (WIDNR 1994). Minnesota's classification requires that a proposed new or increased discharge would not be allowed unless there was no prudent and feasible alternative (Dr. David Maschwitz, Minnesota Pollution Control Agency, pers. comm.). As of September 1997,

the two states were reviewing the classifications to ensure conformity.

The water in the riverway is characterized as a calcium bicarbonate type, which reflects the glacial drift through which the groundwater flows (Graczyk 1986). Dissolved oxygen is generally high, above 5 milligrams per liter, and is sufficient to support good populations of warm-water game fish. Dissolved oxygen levels and temperatures in the upper reaches of the Namekagon are capable of supporting cold-water game fish.

The water in the St. Croix and Namekagon Rivers has a moderate brown color caused principally by organic acids and fine organic detritus drained from the thousands of acres of marshes and peat bogs in the river basin. Additional discoloration and loss of clarity is due to high quantities of sediments carried into the river from tributaries or scoured from the river channel during heavy runoff events. Water transparency, as measured by Secchi disc readings, may vary from 2 to 4 feet, depending on the lapsed time since the last runoff.

Numerous studies have been conducted on the water quality of the two rivers, mostly in the 1970s and early 1980s. Thirteen sites on the upper riverway were monitored on a recurring basis and many other sites have had infrequent or one-time monitoring. Most of the data from the monitoring efforts are stored in the Environmental Protection Agency's (EPA) storage and retrieval data base (STORET). All of the STORET data for the Namekagon and St. Croix were recently compared with the EPA's water quality criteria for freshwater ecosystems and for drinking water (NPS 1995b). EPA criteria were exceeded for some parameters, primarily, copper, lead, fecal coliform, and mercury; nickel, cobalt, zinc, and arsenic were also exceeded but less frequently (table 3). It should be emphasized that the frequency of times the above criteria were exceeded was relatively low.

TABLE 3: EPA WATER QUALITY CRITERIA EXCEEDANCES

STATION (AGENCY)	PARAMETER EXCEEDED*	TIMES EXCEEDED	TIMES ANALYZED	YEARS MONITORED
Namekagon at Hayward (USGS)	Copper total - FA	1	8	1975 -83
	Lead total - DW	1	9	1975 - 83
	Nickel total - DW	1	9	1975 - 83
Namekagon near Trego (USGS)	Lead total - DW	2	9	1975 - 83
Namekagon at State Highway 77 (WIDNR)	Low limit pH	2	69	1984 - 94
Namekagon at Namekagon Trail Bridge (WIDNR)	Copper total - FA	2	24	1977 - 79
	Fecal coliform	1	112	1972 - 84
St. Croix near Dairyland (USGS)	Low limit pH	1	16	1975 - 83
	Fecal coliform	1	17	1975 - 83
St. Croix at CCC Bridge (USGS)	Arsenic total - DW	1	1	1976
St. Croix near Danbury (USGS)	Copper total - FA	1	8	1975 - 83, 1995
	Lead total - DW	3	9	1975 - 83, 1995
	Fecal coliform	1	28	1976 - 85, 1995
	Low limit pH	1	30	1966 - 85, 1995
St. Croix to MN 48 Bridge West of Danbury (MPCA)	Low limit pH	1	163	1957 - 94
	Cadmium total - FA, DW	4,4	15	1968 - 91
	Total coliform	21	133	1957 - 76
	Copper total - FA	2	101	1968 - 91
	Lead total -DW	4	91	1968 - 91
	Fecal coliform	9	273	1963 - 94
	Mercury total - FA, DW	2,2	63	1970 - 86
	Cadmium total - FA, DW	2,2	2	1968 - 71
St. Croix at Highway 70 (MPCA)	Copper total - FA	2	28	1968 - 71
	Lead total - DW	2	26	1968 - 71
	Zinc total - FA	2	28	1968 - 71
	Coliform total	6	41	1967 - 71
	Fecal coliform	2	41	1967 - 71
St. Croix at St. Croix Falls (WIDNR)	Copper suspended - FA	1	22	1974 - 82
	Copper total - FA	1	22	1974 - 82
	Lead dissolved - DW	1	38	1974 - 86
	Lead suspended - DW	2	21	1974 - 82
	Lead total - DW	4	22	1974 - 82
	Fecal coliform	4	74	1974 - 86
	Mercury dissolved - FA, DW	1,1	38	1974 - 86
St. Croix at Taylors Falls (MPCA)	Oxygen dissolved	2	103	1953 - 77
	Cadmium total - FA, DW	2,2	2	1971 - 77
	Copper total - FA	3	60	1971 - 77
	Lead total - DW	6	50	1972 - 77
	Nickel total - DW	1	61	1971 - 77
	Zinc total - FA	4	61	1971 - 77
	Coliform total	17	89	1953 - 76
	Fecal coliform	8	71	1971 - 77
St. Croix at Taylors Falls (USGS)	Mercury total - FA, DW	2,3	44	1971 - 77
	Fecal coliform	1	3	1981 - 83

SOURCE: NPS 1995c

KEY TO PARAMETERS EXCEEDED: DW = drinking water; FA = fresh water acute

*The test for fecal coliform did not differentiate between human and animal sources.

The criteria also were exceeded at different sites and at different times throughout the upper riverway — there was no pattern regarding when the criteria were exceeded. Most of the cases where standards were exceeded can be attributed to natural causes, such as the geology and soils of the watershed and rainfall.

At the request of the National Park Service, surface water quality was studied at 10 sites along the St. Croix and Namekagon Rivers from 1975 through 1983 by the U.S. Geological Survey (Graczyk 1986). Water quality was found to be good for most uses, and concentrations of most parameters analyzed (e.g., suspended sediment, major anions and cations, mean concentrations of phosphorus and nitrogen, total phosphorus loads) were below those in most stations in other Wisconsin rivers. The average suspended sediment concentration for nine stations on the St. Croix was 7.7 milligrams per liter of water, and the average for Wisconsin rivers was 110 milligrams per liter. Graczyk's study found that dissolved oxygen readings never went below the EPA recommended level necessary to maintain fish populations. No pesticides were detected in a water-sediment mixture or bottom sediments along the riverway.

The Wisconsin Department of Natural Resources' analysis of conditions in the St. Croix and Namekagon in 1994 concluded that water quality was good and has not changed significantly over time, with the possible exception of ammonia concentrations (WIDNR 1994). The department determined that the overall aquatic invertebrate community reflected good water quality. The rivers' conductivity — a measure of the concentration of dissolved ions in the water — increased gradually going downstream. This is consistent with changes in the geology and soil types as one heads downstream in the upper riverway.

Boyle et al. (1992) found the range of total nitrogen remained similar throughout all of the mainstem sites, while phosphorus increased slightly going downstream on the upper riverway. Boyle's study found that the aquatic community structure, taxonomic richness, and

density were reduced when comparing upstream sites to downstream sites.

Fago and Hatch (1993) observed that the St. Croix has very low concentrations of suspended sediment and total phosphorus compared to other Midwestern streams of comparable basin size. Indeed, they stated the river has one of the lowest suspended sediment loads in the Upper Midwest.

The U.S. Geological Survey reactivated its monitoring efforts in the St. Croix and Namekagon Rivers in 1995 and will continue to monitor the rivers for several years as part of the National Water Quality Assessment Program (USGS 1996). In 1995 nutrient levels were near or below detection limits. The highest concentrations occurred during August. As with previous studies, pH readings were above 7 (neutrality). Analyses of sediments from the river beds revealed no detectable pesticides except for the insecticide Endosulfan-I. Major metals and trace element concentrations in the bed sediment were characteristic of sediments in the basin. However, several organic compounds were detected at one site on the Namekagon River (near Leonards, Wisconsin) and two sites on the St. Croix River (near Danbury, Wisconsin, and Sunrise, Minnesota), including pyrene; phenol; benzo(k)fluoranthene; 2,6-dimethylnaphthalene; fluoranthene; benzo(b)fluoranthene; and dibutyl-, diethyl-, and bis(2-ethylhexyl)-phthalate. Detected concentrations ranged from 19-100 micrograms per kilogram. The Namekagon River near Leonards had the highest concentrations for seven of the nine compounds. In addition, benzo(a)pyrene, anthracene, benzo(a)anthracene, chrysene, and para cresol were detected on the Namekagon. The presence of the above organic compounds is of concern. The source of the compounds is unknown.

Fish tissue samples were also collected and analyzed by the U.S. Geological Survey for trace elements and synthetic organic compounds. Compared to the results of a national study where whole fish tissue was analyzed, the Upper St. Croix fish liver tissue had higher concentrations of arsenic, copper, zinc, cadmium, selenium, and mercury. No synthetic

organic compounds were detected in fish tissue at the Namekagon River near Leonards or the St. Croix River at Sunrise. However, DDE, a metabolite of DDT, was detected on the St. Croix River at Danbury.

The Upper St. Croix and Namekagon Rivers and their feeder streams generally are considered relatively unpolluted from either industrial or municipal sources. However, the disposal of human wastes at primitive campsites along the riverway and the runoff of salt deicing agents used on nearby roads and riverway bridge crossings are two likely nonpoint pollution sources in the upper riverway.

Most of the pollution of the rivers upstream of St. Croix Falls is believed to be due to nonpoint sources outside of the riverway, primarily runoff from land altered by agriculture, forestry, roads, or development. Phosphorus in the upper riverway's tributaries was generally found to be greater than the phosphorus in the main stem, with the Kettle and Snake Rivers having the highest concentrations (Graczyk 1986). The Clam River is recognized for the turbidity it contributes to the St. Croix (WIDNR 1994). Boyle et al. (1992) found that the density and diversity of the aquatic invertebrate community were reduced at the confluence of the Clam and St. Croix Rivers — probably due to the sediment loads transported by the Clam River. Fago and Hatch (1993) also noted that streambank erosion has been reported along some of the St. Croix's tributaries (i.e., the Snake and Sunrise Rivers).

Other potential pollution sources outside of the riverway include groundwater contamination and discharges from point sources. Groundwater contamination from any number of sources could potentially contribute pollutants to the riverway. Potential pollution point sources along the upper riverway include discharges from municipal wastewater treatment facilities and effluents from four cranberry culture operations.

In summary, water quality conditions within the upper riverway are generally good. The major threats to water quality are from activities and land disturbance outside the riverway boundaries.

GROUNDWATER

Groundwater occurs in Precambrian and Paleozoic sandstones as well as in river alluvium and glacial drift along the Namekagon and St. Croix Rivers. Groundwater levels may range from 50 feet below the surface in Paleozoic and Precambrian aquifers to 5 feet in areas where glacial clay deposits overlie aquifers in drift or bedrock.

Groundwater discharge areas are along the St. Croix River and tributary valleys where numerous springs issue from exposed Paleozoic sandstones along the valley bluffs. Groundwater recharge occurs during the spring breakup and during intense storms of sufficient duration to satisfy soil moisture deficiencies.

Potential but unverified sources of groundwater contamination in or near the upper riverway include leaking underground storage tanks, municipal wastewater treatment systems, failing individual septic systems, industrial discharges, landfills, pesticide and fertilizer use, illegal discharges of hazardous materials, and spills.

The National Water Quality Assessment Program discussed above will also be monitoring groundwater quality in the St. Croix River basin.

FLOODPLAINS AND WETLANDS

Flooding is most likely to occur on the Upper St. Croix and Namekagon Rivers from snowmelt in the spring and occasionally from intense storms in the summer. Although no widespread major flooding has occurred in recent years in the Upper St. Croix basin, minor localized flooding has occurred.

A peak discharge of about 39,800 cfs can be expected on the St. Croix River at St. Croix Falls once every 10 years and has a 10% chance of occurring in any one year (i.e., the 10-year flood). On the Namekagon at Trego, a peak discharge of about 1,980 cfs can be expected once every 10 years and has a 10% chance of occurring in any one year. (U.S. West, Optical Publishing 1987). Table 4 shows the 100-year and 500-year flood discharge rates for two sites

on the St. Croix and one on the Namekagon. These rates are based on data collected over 45 years by the U.S. Geological Survey.

The Federal Emergency Management Agency (FEMA) has mapped the 100-year flood boundaries for most of the upper riverway for flood insurance rates; 500-year flood boundaries have not been mapped. The 100-year flood boundaries for the Upper St. Croix and Namekagon average about 1,000 feet in width, although this varies considerably depending on topography. As one proceeds up the rivers, the floodplain decreases in width. Overall, about one-half to two-thirds of the lands in the riverway are within the 100-year flood boundaries, although this figure shrinks to less than one-half in the upper reaches of the Namekagon and St. Croix where the floodplain is narrower. No base flood elevations were determined by the Federal Emergency Management Agency.

In 1982 the U.S. Geological Survey delineated the 100-year floodplain for five sites on the Namekagon and one on the Upper St. Croix (USGS 1982). The 100-year flood elevations ranged from 1,338 feet on the Namekagon River at County Highway M near Cable, to 790 feet on the St. Croix River near Rush City. (For comparison, the normal elevations of these two sites are 1,340 feet and 780 feet respectively.)

With the exceptions of the flowages and dams, most of the Upper St. Croix and Namekagon Rivers' floodplains are relatively natural and are of high value to the riverway's ecosystem quality. Indeed, this is one of the riverway's outstandingly remarkable features; few if any large river floodplains in the Midwest are as well preserved for long stretches as those along the Upper St. Croix and Namekagon. NPS facilities in the 100-year floodplains are limited to campsites, trails, picnic areas, and boat launch sites. Other developments on the floodplains include bridges, a few parcels with non-NPS buildings in the upper section of the Trego Flowage, and scattered use and occupancy residences in the upper riverway. The floodplain for the town of Hayward was not mapped by Federal Emergency Management Agency. No

TABLE 4: DISCHARGE RATES IN CUBIC FEET PER SECOND FOR THE 100-YEAR AND 500-YEAR FLOODS ON THE UPPER ST. CROIX AND NAMEKAGON RIVERS

	100-YEAR FLOOD	500-YEAR FLOOD
St. Croix River at St. Croix Falls	56,800	66,100
St. Croix River near Grantsburg	26,900	33,700
St. Croix River near Danbury	11,110	13,700
Namekagon River near Trego	3,830	5,880

SOURCE: Hydrodata CD ROM, published by U.S. West, Optical Publishing 1987, furnished by NPS employee Gary Smilie.

levees are present on the upper riverway that would affect flooding.

Much of the land within the upper riverway boundary is covered by various types of wetlands, including swamps, marshes, bogs, fens, wet meadows, ponds, sloughs, and seeps. These wetlands exist primarily on the riverine edge within the riverway. They also occur on upland sites where the water table is close to the surface, or where surface water is trapped in depressions with restricted drainage.

Different classification systems have been used to map wetlands along the upper riverway. On the Minnesota side of the St. Croix, wetlands have been mapped (1:24,000 scale) using the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (USFWS 1979). About 40% to 45% of the land within the riverway boundary of the Minnesota side is classified as wetland. Sixty-eight different wetland types are present, of which the three most common types are PF01A (palustrine, broad-leaved deciduous forested wetlands that are temporarily flooded; 1,229 acres); PSS1B (palustrine, broad-leaved deciduous scrub/shrub wetlands that are saturated; 128 acres); and PEMB (palustrine, emergent wetlands that are saturated; 95 acres).

Wetlands in Wisconsin have been mapped using a different classification system developed by the state of Wisconsin. This system is also based on the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States*, but with a few simplifications to make it easier to understand and use. About 28% of the lands within the riverway boundary on the Wisconsin side of the St. Croix and along the Namekagon River are classified as wetland.

Eighty-nine different types of wetlands are identified by the state as being within the upper riverway's boundary. The three most common types, accounting for about 49% of the wetlands on the Wisconsin side of the upper riverway, are palustrine, have wet soil, and do not appear to have surface water for prolonged periods of time. T3K is the largest wetland type, covering about 4,600 acres. It consists of forested areas with broad-leaved, deciduous trees such as black ash, elm, and silver maple. S3K wetlands are covered by broad-leaved, deciduous scrub/shrub such as willow, alder, and young green ash, and encompass about 1,400 acres. T3/8K wetlands are covered by a mixture of deciduous and coniferous trees and encompass about 1,300 acres.

In addition to these classification systems, the National Park Service contracted for a survey of wetlands along the riverway (Glenn-Lewin, Rosburg, and Hoef 1992). In 1987, 1990, and 1991, wetlands along the St. Croix were mapped and inventoried from the St. Croix Flowage at Gordon Dam to Stillwater and on the Namekagon from Lake Namekagon to the confluence with the St. Croix. Biologists identified and mapped 92 wetlands all along the Upper St. Croix from the St. Croix Flowage at Gordon Dam to Taylors Falls and 73 wetlands on the Namekagon. Thirty-three of these wetlands were actually inventoried and classified into eight vegetation types: exposed banks and mudflats (1 site); fluctuating marsh (4 sites); fluctuating marsh/shrub carr (2 sites); deep basin marsh (13 sites); flowage marsh/woodland (5 sites); hydric mature woodland (4 sites); hydric semi-woodland (5 sites); and wet/mesic woodland (1 site). The most common wetland type, deep basin marsh, can be considered the "typical

marsh" — areas with emergent herbaceous vegetation growing in standing water. The biologists also observed that most of the wetlands in the riverway were in excellent condition, with little evidence of disturbance to sites.

BIOLOGICAL RESOURCES

The Upper St. Croix Riverway is ecologically significant for many reasons. The riverway is in

a biotic "tension zone," where the boreal forests of the north meet the northern hardwood forests of the east and the prairies of the west. As a result, a mosaic of biological communities occurs along the riverway, including boreal hardwood and northern hardwood forests, pine savannahs, lowland forests, shrub swamps, and wet meadows. Moreover, the riverway provides an edge zone where land meets water, which creates diverse habitats for both aquatic and terrestrial species. Several special habitats occur that are rare or unique in this region: ground-water seepage areas, bedrock outcrops, oak savannahs, and floodplain islands harbor their own special plant associations and wildlife populations. The north-south orientation of the riverway is an important route for bird migrations and the dispersal of mammals. With its variety of habitats, soil types, and landforms, the riverway is considered to be a hot spot from a biodiversity standpoint, supporting a rich fauna and flora population.

VEGETATION

The Upper St. Croix and Namekagon Rivers are in a vegetation region called the northern hardwood province (Curtis 1971). This area is characterized by the presence of conifers and a significant number of hardwood species. Extensive stands of pine were once present in the northern part of the upper riverway. Based on historical records, Curtis described the major forest types in northern Wisconsin in the 1800s:

The wet lands contained either conifer swamps, dominated by tamarack, black

spruce, and white cedar, or hardwood swamps with black ash and yellow birch. The dry lands were dominated by pine, with jack and red pine on the lighter sands and white pine on the sandy loams. The heavier soils were typically covered by mixed conifer-hardwoods, with white pine hemlock, balsam fir, and white spruce . . . , sugar maple, basswood, yellow birch, American elm, red oak, and ironwood. . . (p.177)

From the mid-1800s through the early 1900s much of the forests, particularly the pines, along the upper riverway were logged. With the exception of wetlands, intensive logging and associated fires drastically changed the northern forest. Second-growth forests of aspen and birch replaced many of the pine forests. Only occasional pine that were either inaccessible or immature were left standing along the riverway.

Today, the same plant communities generally occur along the Upper St. Croix and Namekagon as existed in pre-settlement times, with second-growth pines growing among stands of mixed hardwoods (Chuck Adams, WIDNR, pers. comm.). However, the structure, composition, and functions of these communities have changed. Late successional forest communities are still present, but older trees within these communities are now rare or absent. The upland conifer component of the communities has generally decreased, while aspen and paper birch (which are disturbance, pioneer species) have greatly increased compared to presettlement times. Pine plantations also occupy much of the former semiopen “barrens.”

Terrestrial Plant Communities. Plant community distribution along the riverway is governed by a variety of considerations, such as soil type, landform, aspect, slope, and moisture. For example, northern hardwood forests occur on loamy or sandy loamy soils, and lowland hardwood forests occur on mineral soils. Lowland communities are also strongly influenced by the periodicity and duration of flooding as well as proximity to the water table.

Most of the lands along the Upper St. Croix and Namekagon Rivers are forested. Six general terrestrial plant community types occur most frequently along the Upper St. Croix and Namekagon Rivers — northern hardwood forest; boreal hardwood-conifer forest; maple-basswood forest; lowland hardwood forest; conifer swamp; and hardwood swamp forest. Many of these forest communities are intermingled along the riverway and lack well-defined boundaries. Several of the communities also can be divided into subtypes, but for purposes of this discussion they are lumped together.

Northern hardwood forests — These forests occur throughout the upper riverway, but they are most common in the Namekagon headwaters area and along the St. Croix in Pine and Chisago Counties in Minnesota and Polk and Burnett Counties in Wisconsin. This late-successional forest community occurs in dry to mesic (moist) areas that have been protected from fire. Dominant trees include sugar maple (*Acer saccharum*), basswood (*Tilia americana*), and yellow birch (*Betula alleghaniensis*). Unlike the maple-basswood forests, this community also has a significant conifer component, including white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), and white cedar (*Thuja occidentalis*).

Boreal hardwood-conifer forests — These forests occur along the Namekagon, particularly where the soils are well-drained sandy loams or coarser soils on slopes. The proportions of canopy trees vary according to soil texture and depth. Dominant trees in this forest community are white pine, jack pine (*Pinus banksiana*), red pine (*Pinus resinosa*), white cedar, black spruce (*Picea mariana*), white spruce, quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), and red maple (*Acer rubrum*). Also commonly found here are white cedar, and balsam fir (*Abies balsamea*).

Maple-basswood forests — These forests occur throughout the upper riverway but are

predominately found on both sides of the St. Croix from Wild River State Park to Taylors Falls. This late-successional, shade-tolerant community tends to occur on mesic sites. In the absence of disturbance, it is self-perpetuating. Basswood, sugar maple, red oak (*Quercus rubra*), and green ash (*Fraxinus pennsylvanica*) dominate this forest community.

Lowland hardwood forest — This forest is another community that occurs throughout the upper riverway. It is most evident at the St. Croix–Namekagon confluence and in the Wild River State Park area. Lowland hardwood forests occur on wet sites, with a seasonally high water table, usually on flat terrain or river terraces above normal flood levels. Trees that dominate this forest community include basswood, black ash (*Fraxinus nigra*), green ash, red oak, quaking aspen, and yellow birch.

Conifer swamps — These swamps occur primarily on the upper reaches of the St. Croix and Namekagon Rivers above Riverside. These swamps occur on sites with wet mineral or poorly drained, nutrient-poor, organic soils. They occur in wet areas, but they are on sites above normal flood levels. The conifer swamps' canopies are dominated by black spruce, tamarack (*Larix laricina*), and white cedar. These conifers are usually mixed with hardwoods, commonly yellow birch, paper birch, and red maple.

Hardwood swamps — These swamps occur primarily on the upper reaches of the upper riverway, but they also occur south of Riverside, such as in northern Chisago County. Unlike lowland hardwood forests, lowland hardwood swamps grow on nutrient-poor muck or shallow peat soils that are continuous or nearly continuously saturated. They usually are above the floodplain and often are associated with springs and seepages. The canopy is typically dominated by red maple, paper birch, slippery elm (*Ulmus rubra*), and black ash; tamarack also

is occasionally present, but in far fewer numbers than in conifer swamps.

Several other terrestrial plant communities occur in small pockets or intermittently in the upper riverway. Aspen-paper birch forests occur in a few areas. Remnant white pine-hardwood forests that were not logged also occur in a few locations. Floodplain forests, dominated by silver maple (*Acer saccharinum*) and green ash, occur from Wild River State Park to the St. Croix Falls area. These forests are on the St. Croix River's active floodplain and are periodically inundated by flooding. Semiopen pine barrens, dominated by jack pine (*Pinus banksiana*), bur oak (*Quercus macrocarpa*) and northern pin oak (*Quercus ellipsoidalis*), grow on small upland areas on the Wisconsin side of the St. Croix from roughly the confluence with the Namekagon River down to the Trade River (about 3 miles upstream from the Nevers Dam site). This community occupies a much smaller area than it once did; most of the former barrens are now covered with red and white pine plantations or have grown up into dense pine-oak forest.

Aquatic Plant Communities. Several aquatic plant communities can be distinguished along the upper riverway. Algal communities, composed mainly of blue-greens, greens, yellow-greens, diatoms, and Cryptophyta, are found in both standing and moving water. Community composition and abundance vary according to seasonal changes and local river influences. Stagnant or backwater areas are more likely to experience "blooms" than moving water.

Submerged or floating aquatic vascular vegetation is of two distinct types, lentic (standing water) and lotic (moving water). Plant species within lotic communities consist primarily of wild celery (*Vallisneria americana*) and pondweed (*Potamogeton* sp.). Lentic communities include slack or backwater areas generally formed by obstructions. Principal vegetation types include coontail (*Ceratophyllum demersum*), pondweed, duckweed (*Spirodela* spp.), water lilies (*Nymphaea* spp.), bur-reed (*Sparaganium* spp.), and prairie cordgrass (*Spartina* spp.). Wild rice (*Zizania*

palustris) occurs along the riverway in still water areas such as the Pacwawong Flowage.

There are also several transitional terrestrial-aquatic communities (i.e., wetlands) that occur along the riverway. Dense alder shrub swamps, dominated by alder (*Alnus rugosa*), gray dogwood (*Cornus foemina*), red-osier dogwood (*C. stolonifera*), silky dogwood (*C. amomum*), and willow (*Salix* sp.), grow on narrow strips along the riverbanks and along backwater areas throughout the upper riverway. Emergent aquatic vegetation is generally sparse along rocky or sandy shorelines exposed to current.

Emergent marshes occur on narrow strips along the river, particularly around the flowages. These wetlands are dominated by herbaceous plants that stand above the water, including broad leaved cattail (*Typha latifolia*), river bulrush (*Scirpus fluviatilis*), sedges (*Carex* sp.), Small's spikerush (*Eleocharis smallii*), giant bur-reed (*Sparganium eurycarpum*), and blue joint grass (*Calamagrostis canadensis*). Slack-water shorelines behind islands and backwater areas also frequently demonstrate dense stands of cattail, rush, or sedges. Exposed mudflats frequently produce broad-leaved arrowhead (*Sagittaria latifolia*), spike rush (*Eleocharis acicularis*), or water plantain (*Alisma plantago aquatica*). Wet sedge meadows occur in a few areas along the rivers' banks and sometimes on embayments or old stream channels. Dominant species in the sedge meadows include tussock sedge (*Carex stricata*) and blue joint grass. Several types of fens (alkaline, groundwater-driven peatlands, commonly covered by grasses, sedges, and forbs) occur in seepage and backwater areas along the upper riverway (Chuck Adams and Mike Giles, Wisconsin and Minnesota Departments of Natural Resources, pers. comm.)

Plant Diversity. The upper riverway has a diverse flora. A comprehensive plant inventory has not been conducted for the riverway. More than 350 vascular plant species, representing 81 families, have been documented or are believed to occur in the upper riverway. The Compositae family has the largest number of species present. Some 45 species of native trees and seven

ornamental tree species have been recorded in the St. Croix River valley (Warren, Crow, and Probst 1993).

Little information is available on nonvascular plants in the riverway. Wetmore (1991) studied lichens at 77 sites along the entire riverway. He observed that the riverway had a diverse lichen flora, with a total of 265 identified species. Most of the species were found along the whole length of the riverway, although 10 species were only found south of Taylors Falls and a number of species only occurred on the basaltic rocks around Taylors Falls.

Nonnative or exotic plant species occur throughout the riverway on lands that have been disturbed by human activities and on lands populated by seeds from lands adjacent to or near the riverway. In 1985 more than 80 exotic plant species were listed for the upper and lower riverway (NPS 1985). Many of these species occur along the Upper St. Croix and Namekagon. Some of the more pervasive and aggressive exotics that have been found on the upper riverway include purple loosestrife, spotted knapweed, and reed canary grass.

WILDLIFE

With its variety of upland, lowland, and aquatic habitats and ecotones, the Upper St. Croix National Scenic Riverway supports a diversity and abundance of wildlife. More than 430 species of birds, fish, mammals, amphibians, reptiles, dragonflies, and mussels and clams have been recorded on the Upper St. Croix and Namekagon Rivers.

There are a few known exotic animal species in the upper riverway. The brown trout and starling are two common nonnative species. One species of concern is the zebra mussel — an invasive exotic that outcompetes native species and is spreading throughout navigable waterways. The zebra mussel not yet invaded the upper riverway; however, an isolated find of zebra mussels occurred 2 miles north of the NSP dam in July 1997. In 1994 the rusty crayfish (*Orconectes rusticus*) was reported in both the Upper St.

Croix and Namekagon Rivers. Although little information is available on the crayfish's distribution and abundance, the presence of this aggressive exotic species is of concern because it can displace native species.

Invertebrates. Terrestrial invertebrates have not been well studied on the upper riverway, and little data exist for aquatic macroinvertebrates. Common groups of aquatic invertebrates known to occur in the upper riverway include worms, insects, leeches, snails, clams, crayfish, and mussels. In their review of studies that have been done in the St. Croix River basin from 1966–91, Fago and Hatch (1993) found specimen records for 218 species, 171 genera, and 70 families of aquatic invertebrates in the Upper St. Croix basin. Most of the specimens were collected on the mainstem of the St. Croix, with a few on tributaries near their confluences with the mainstem. Most of the invertebrate specimens collected were insects: 190 species of insects were identified.

Dragonflies and damselflies have been surveyed throughout the riverway. A total of 45 species of dragonflies and damselflies have been identified on the upper riverway by the Wisconsin Department of Natural Resources Natural Heritage Program. One of these dragonflies, the St. Croix snaketail (*Ophiogomphus susbehcha*), is of special interest: this newly discovered species was first found along the middle reaches of the St. Croix in 1989.

The St. Croix and Namekagon Rivers support one of the most diverse mussel populations in the Upper Mississippi River system, with 90% of the potential mussels species being present (NPS 1995c). More species occur on the Lower St. Croix, probably due to the blockage of upstream migration at the Taylors Falls dam (Fago and Hatch 1993). A 1987 freshwater mussel and clam survey found 21 species above Taylors Falls. An unpublished study of the upper riverway done from 1987–89 found 25 mussel species on the Upper St. Croix River and 17 species on the Namekagon (Fago and Hatch 1993). In 1995 two previously undocumented mussel species, the fragile papershell (*Leptodea fragilis*) and pink heelsplitter (*Potamilus alatus*),

were identified in the lower reaches of the Namekagon. Native mussels need host fish to complete their life cycle, but most of the host fish species for mussels in the riverway are unknown.

Fish. The Upper St. Croix and Namekagon Rivers generally support healthy, diverse fish populations. Fago and Hatch (1993) provided the most up-to-date information on the distribution of fish species in the St. Croix River basin. Historically, 70 fish species have been identified in the Upper St. Croix mainstem and 67 species in the Namekagon basin between 1889 and 1990. Of these, 65 have been identified since 1974 in the Upper St. Croix; 5 species have not been identified since 1974 — sauger (*Stizostedion canadense*), trout-perch (*Percopsis omiscomaycus*), weed shiner (*Notropis texanus*), pugnose shiner (*Notropis anogenus*), and pallid shiner (*Notropis amnis*). There have been no known changes in fish species on the Namekagon.

There are significant differences in the fish species that occur in the upper riverway and lower riverway. Fago and Hatch (1993) listed 18 species that occur in the upper mainstem but not in the lower mainstem, and 22 species that occur in the lower mainstem but not in the upper mainstem. The dams at St. Croix Falls, Trego, Hayward, and perhaps the smaller ones at Pacwawong and Phipps are some of the major causes of this variation, preventing fish movement from one segment of the river to another, possibly keeping some species from former spawning grounds, and impacting freshwater mussel communities.

• Warm-water riverine fisheries occur on the Upper St. Croix from the Gordon Dam to Taylors Falls and on the Namekagon from Trego to the confluence with the St. Croix. Common fish found on these stretches include smallmouth bass (*Micropterus dolomieu*), walleye pike (*Stizostedion vetreum*), northern pike (*Esox lucius*), muskellunge (*Esox masquinongy*), catfish (*Ictalurus punctatus*), and a variety of redhorse suckers (*Moxostoma* sp.) and minnows.

Cold-water riverine fisheries are present on the Namekagon from Lake Namekagon to Hayward, and cool water fisheries are present from Hayward to Trego. Portions of these stretches and several of the Namekagon's tributaries are classified as Wisconsin state trout waters. Examples of common fish that occur here include rainbow, brook and brown trout, mottled sculpin (*Cottus bairdi*), and a variety of suckers and minnows. The impoundments or flowages on the two rivers have distinctive riverine-lake characteristics. Fish found here favor larger pools and include smallmouth bass, largemouth bass (*Micropterus salmoides*), muskellunge, northern pike, walleye pike, blue-gill (*Lepomis macrochirus*), crappie (*Pomoxis nigromaculatus*), redhorse sucker, yellow perch (*Perca flavescens*), and rock bass (*Ambloplites rupestris*).

Several fish species have been introduced either intentionally or unintentionally in the Upper St. Croix and Namekagon Rivers, including the common carp (*Cyprinus carpio*), rainbow trout, brown trout, sheephead (*Aplodinotus grunniens*), and black-sided darter (*Percina maculata*). (The brook trout is the only native trout in the St. Croix basin.) In addition, it is unclear whether muskellunge and northern pike are native to the St. Croix basin (Frank Pratt, WIDNR, pers. comm.). With the exception of the rainbow trout, all of these species now have reproducing populations in the mainstem. (Even in the case of the rainbow trout, there are naturally reproducing populations in at least one tributary [Frank Pratt, WIDNR, pers. comm.]) Most of the trout in the Namekagon are above Hayward, and most are in the river's tributaries. They probably use the mainstem seasonally, such as for overwintering. The Wisconsin Department of Natural Resources continues to stock walleye and muskellunge in the flowages and brown and rainbow trout in the Upper Namekagon. The Wisconsin Department of Natural Resources plans to reintroduce the gilt darter (*Percina evides*) to the Upper Namekagon above the Trego dam.

One species of concern in the upper riverway is the lake sturgeon (*Acipenser fulvescens*). This fish grows very slowly. In recent years the num-

ber of adults has been declining in the upper riverway, possibly due to overharvesting in the 1970s. Both the Wisconsin and Minnesota Departments of Natural Resources have closed this fishery on the Upper St. Croix and Namekagon Rivers. To increase the sturgeon's population, in the summer and fall of 1995 the Wisconsin Department of Natural Resources began stocking sturgeon fry and fingerlings from Yellow Lake in the Namekagon above the Trego dam.

Amphibians and Reptiles. Little information exists regarding the populations and status of amphibian and reptile species that occur along the upper riverway. Eighteen amphibian and 14 reptile species have been documented on the upper riverway. Common amphibian and reptile species present include the snapping turtle (*Chelydra serpentina*), eastern spiny softshell turtle (*Trionyx spiniferus*), painted turtle (*Chrysemys picta*), eastern garter snake (*Thamnophis sirtalis*), green snake (*Ophreodryx vernalis*), hog-nosed snake (*Heterodon platyrhinos*), red-backed salamander (*Plethodon cinereus*), American toad (*Bufo americanus*), and numerous species of frogs — e.g., spring peeper (*Hyla crucifer*) and green frog (*Rana clamitans*). There are no known poisonous snakes in or near the riverway. From 1993–95, the U.S. Forest Service surveyed the St. Croix from near the Highway 70 bridge to Marine on the St. Croix for reptiles and amphibians, focusing on turtles, but the results of this survey are still pending.

Birds. The upper riverway supports a diverse population of upland and water birds. More than 200 species have been documented on the Upper St. Croix Riverway, more than 120 of which likely nest. Birds that river travelers would most likely see include robin (*Turdus migratorius*), purple finch (*Carpodacus purpureus*), redwing blackbird (*Agelaius phoeniceus*), great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), American kestrel (*Falco sparverius*) wood duck (*Aix sponsa*), belted kingfisher (*Ceryle alcyon*), bald eagle (*Haliaeetus leucocephalus*), tree swallow (*Tachycineta bicolor*), and a variety of warblers. Birds commonly seen in the winter include black-

capped chickadee (*Parus atricapillus*), downy and hairy woodpecker (*Picoides pubescens* and *Picoides villosus*), purple finch, and evening grosbeak (*Coccothraustes vespertinus*). Five raptor species are present at least seasonally along the two rivers: osprey (*Pandion haliaetus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), broad-winged hawk (*Buteo platypterus*), rough legged hawk (*Buteo lagopus*) and bald eagle. Upland game bird species most frequently seen in the area are ruffed grouse (*Bonasa umbellus*), woodcock (*Scolopax minor*), and turkey (*Meleagris gallopavo*) (which was recently reintroduced in Burnett and Polk Counties).

The St. Croix Riverway is considered to be very productive for wood ducks and mallard (*Anas platyrhynchos*). Ring-necked ducks (*Aythya collaris*) and hooded mergansers (*Lophodytes cucullatus*) also nest along the riverway, and use by Canada geese (*Branta canadensis*) is increasing. Waterfowl use is greatest during the spring and fall migrations. Waterfowl that are likely to be seen include mallard, blue-winged teal (*Anas discors*), common and red-breasted merganser (*Mergus merganser* and *Mergus serrator*), ring-necked duck, wood duck, and Canada goose. Several pairs of rare trumpeter swans (*Cygnus buccinator*) also stop on the St. Croix River north of St. Croix Falls during the fall migration.

Mammals. There is very little baseline information on the distribution and abundance of mammals within the upper riverway; most data are limited to fur bearers and game species. Many mammals common to both the northern coniferous forest and the temperate deciduous forest use the riverway and move back and forth across the riverway's boundaries. They also use the riverway as a corridor, moving north and south. As a result, the riverway has a very diverse mammal population: 60 species of mammals have been observed on the upper riverway.

The white-tailed deer (*Odocoileus virginianus*) is the big game animal most likely to be seen by river travelers. The riverway is surrounded by good to excellent deer habitat; consequently, the

riverway and adjacent lands support a population of some 20 to 35 deer per square mile (Pat Savage, WIDNR, pers. comm.). Other mammals likely to be seen by the average river traveler in and near the water include mink (*Mustela vison*), weasel (*Mustela* sp.), skunk (*Mephitis mephitis*), otter (*Lutra canadensis*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), woodchuck (*Marmota monax*), and raccoon (*Procyon lotor*). Smaller mammals that occur throughout the area include gray and red squirrel (*Sciurus carolinensis* and *Tamiasciurus hudsonicus*), masked shrew (*Sorex cinereus*), short-tailed shrew (*Blarina brevicauda*), eastern mole (*Scalopus aquaticus*), little brown myotis (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), deer mouse (*Peromyscus maniculatus*), and meadow vole (*Microtus pennsylvanicus*). The mice and voles prefer the plains and meadows, while the shrews and moles prefer wetter areas bordering the river.

Mammals in the upper riverway that are less likely to be seen include snowshoe hare (*Lepus americanus*), black bear (*Ursus americanus*), coyote (*Canus latrans*), badger (*Taxidea taxus*), red and gray fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and wolf (*Canus lupus*). Occasionally moose (*Alces alces*) are found in the upper riverway.

Consumptive Uses. Both plants and animals are harvested in the upper riverway. A small amount of blueberry, raspberry and blackberry picking occurs throughout the upper reaches of the riverway. Wild rice harvesting by Indians and non-Indians occurs in the Pacwawong, Phipps, and Trego Flowages. Private landowners with scenic easements can log their lands in accordance with the terms of their scenic easement and in compliance with a county or state timber management plan approved by the National Park Service. Trees are periodically harvested in several county forests along the riverway. However, the county forests observe a 100-foot setback from the rivers' edge, and do not cut within this boundary. The National Park Service also periodically thins pine plantations along the riverway to return the forests to a more natural appearance.

Fishing is one of the most popular recreational activities on the upper riverway. Fishing is permitted along the entire upper riverway, with the Minnesota and Wisconsin Departments of Natural Resources regulating harvests. The Upper St. Croix has a national reputation for its smallmouth bass fishing, while the Namekagon is known nationally for its trout fishing. Other fish commonly sought by anglers include walleye, redhorse, northern pike, and muskellunge. With the possible exception of walleyes in the flowages, particularly the Hayward Flowage, these fisheries are believed to be maintaining themselves.

Hunting is another popular activity along much of the Upper St. Croix and Namekagon. Hunting of upland game birds and waterfowl occurs, primarily in the fall, but is believed to have a minimal effect on the species and populations along the rivers. Past research reveals that hunted and non-hunted ruffed grouse populations behave nearly identically (Pat Savage, WI DNR, pers. comm.).

Several mammal species are hunted and trapped. The Minnesota and Wisconsin Departments of Natural Resources regulate the harvests of these species in the riverway. Deer are the most widely hunted game species. Black bear are also hunted, but on a far lesser scale. There is also hunting of squirrel, fox, coyote, hare, bobcat, and raccoon. Hunting may exert some regulation on local mammal populations, but the populations in the riverway are believed to be relatively stable. Although trapping by non-Indians is prohibited on federally owned lands in the riverway, this activity still occurs on state, county and private lands. Aquatic furbearers, like mink, muskrat, otter, and beaver, are the primary species sought by trappers. Bobcat, raccoon, fox and coyote are also trapped.

Subsistence hunting, trapping, and fishing is also exercised by members of various Chippewa tribes who reserved the right to gather these resources in the area ceded in the treaty of 1837.

THREATENED AND ENDANGERED SPECIES

The Upper St. Croix and Namekagon Rivers serve as a refuge for a number of species that are threatened, endangered, or of special concern. The U.S. Fish and Wildlife Service identified seven endangered and two threatened species on the federal list and one candidate species in counties where the Upper riverway is located (see table 5 and appendix G).

Except for the gray wolf, however, no federal endangered species are known to use the upper riverway. The endangered Higgins' eye pearly mussel and winged maple leaf mussel have never been found north of Taylors Falls on the St. Croix River. The endangered American peregrine falcon does use the lower river, but there are no recent records of peregrine falcons occurring on the upper riverway. The endangered piping plover has not been observed on the upper riverway's sandy beaches and islands, and no populations are known to be near the riverway in Wisconsin or Minnesota. An endangered Kirtland's warbler was observed once several years ago on the upper riverway, but none have been seen since. (This species has never been documented as nesting in Wisconsin; J. Trick, USFWS, pers. comm.). No endangered Karner blue butterflies have been recorded on the upper riverway, but there is potential habitat for this species in the riverway; pine barrens with upland sands and lupine, the butterfly's host species, may support the Karner blue. There are historical records of the butterfly occurring in Burnett and Polk Counties. In 1995 a site in the Governor Knowles State Forest, in or near the riverway, was found that is believed likely to contain Karner blue butterflies (Cathy Bleser, WIDNR, pers. comm.).

The U.S. Fish and Wildlife Service lists the gray wolf as endangered in Wisconsin and threatened in Minnesota. The state of Wisconsin lists the gray wolf as endangered, and Minnesota lists it as a species of special concern. Much of the upper riverway is potential wolf habitat, and the St. Croix River is an important north-south travel corridor for wolves. The junction of the Namekagon and St. Croix Rivers appears to be

TABLE 5: THREATENED AND ENDANGERED SPECIES

	Endangered	Threatened
gray wolf (<i>Canis lupus</i>)	✓in WI	✓in MN
Karner blue butterfly (<i>Lycaedis melissa samuelis</i>)	✓	
piping plover (<i>Charadrius melodus</i>)	✓	
Kirtland's warbler (<i>Dendroica kirtlandii</i>)	✓	
peregrine falcon (<i>Falco peregrinus anatum</i>)	✓	
Higgins' eye pearly mussel (<i>Lampsilis higginsii</i>)	✓	
winged maple leaf mussel (<i>Quadrula fragosa</i>)	✓	
bald eagle (<i>Haliaeetus leucocephalus</i>)		✓
Fassett's locoweed (<i>Oxytropis campestris</i> var. <i>chartacea</i>)		✓

an important staging area for dispersing wolves (Adrian Wydeven, WIDNR, pers. comm.).

Wolves have been increasing in numbers in the vicinity of the upper riverway since the mid-1970s. Since 1975, eight or nine packs, consisting of 36 to 39 wolves, have established territories in or near the riverway. Three of these wolf packs are known to use parts of the upper riverway — the Five-Corners pack uses the St. Croix State Park area; the Crex Meadows pack's territory includes the St. Croix northeast of Grantsburg; and the Crotte Creek pack's territory includes the St. Croix west of Gordon. The territory of a fourth pack, the Smoky Hill pack, may include the Namekagon north of Seeley — additional monitoring needs to be done to determine the extent of this pack's territory. Individuals and pairs of wolves also probably use the riverway from time to time; a pair of wolves half way between Trego and Minong may use the Namekagon, and a female

north of Danbury may use the St. Croix. Although there are no known dens in the riverway, all of the packs using the riverway had pups in 1995 and are expected to increase in number (Adrian Wydeven, WIDNR, pers. comm.).

The U.S. Fish and Wildlife Service identified two species listed as threatened on the federal list in counties that include the upper riverway. It is unlikely that the Fassett's locoweed occurs within the riverway boundaries. This species occurs along fluctuating lakeshores and is generally much further east in Wisconsin (June Dobberpuhl, WIDNR, pers. comm.). However, the bald eagle is common, nesting in tall trees scattered along the Upper St. Croix and Namekagon Rivers.

The riverway is important bald eagle habitat. Most of these eagles migrate in the winter, although some overwinter where there is open water. The upper riverway's bald eagle population has been stable or slightly increasing over the past 10 years. In 1995, 19 active nests were found along the riverway north of Taylors Falls. These nests produced more than 19 young.

One candidate for federal listing — the Canada lynx (*Lynx canadensis*) — also may use the riverway. This species is also listed by the state of Wisconsin as endangered. Lynx have been recorded in several of the counties that border the upper riverway (Jackson 1961), although there are no recent reports of the species occurring in the riverway. It is likely that any animals using the riverway are transient and do not depend on the riverway.

The U.S. Fish and Wildlife Service also maintains a list of species of concern. Further information is needed on these species to determine if it is appropriate to consider them for addition to the federal list of endangered and threatened species. The Fish and Wildlife Service identified 16 animal and three plant species of concern as possibly occurring within the riverway. These include the following species:

- Hill's thistle (*Cirsium hillii*)

- bog bluegrass (*Poa paludigena*) (also listed as endangered in Minnesota and threatened in Wisconsin)
- rough seeded fame flower or prairie fame-flower (*Talinum rugospermum*) (also listed as endangered in Minnesota)
- elusive clubtail dragonfly (*Gomphus notatus*)
- Saint Croix snaketail dragonfly (*Ophiogomphus susbehcha*)
- pygmy snaketail dragonfly (*Ophiogomphus howei*) (also listed as endangered in Wisconsin)
- Sylvan Hygrotus diving beetle (*Hygrotus sylvanus*)
- tawny crescent spot butterfly (*Phyciodes batessi*)
- blue sucker (*Cycleptus elongatus*) (also listed as threatened in Wisconsin)
- lake sturgeon (*Acipenser fulvescens*)
- crystal darter (*Ammocrypta asprella*) (also listed as endangered in Wisconsin)
- greater redhorse (*Moxostoma valenciennii*) (also listed as threatened in Wisconsin)
- snuffbox mussel (*Epioblasma triquetra*) (also listed as endangered in Wisconsin)
- spectacle case pearly mussel (*Cumberlandia monodonta*) (also listed as endangered in Wisconsin)
- salamander mussel (*Simpsonaias ambigua*) (also listed as threatened in Wisconsin)
- Blanding's turtle (*Emydoidea blandingii*) (also listed as threatened in Minnesota and Wisconsin)
- false map turtle (*Graptemys pseudogenographica*)
- northern goshawk (*Accipiter gentilis*)
- cerulean warbler (*Dendroica cerulea*)

There are records of all these species occurring on the upper riverway, with the exceptions of the Hill's thistle, false map turtle, Sylvan Hygrotus diving beetle, and elusive clubtail dragonfly.

The Minnesota and Wisconsin Departments of Natural Resources also maintain lists of threatened and endangered species in their states. In addition to the species listed on the federal list that are noted above as also being listed by a state(s), the following species have been recorded in the upper riverway and are

listed as threatened or endangered in Minnesota or Wisconsin:

- Kitten-tails (*Besseyia bullii*) (threatened in Minnesota)
- Calypso orchid (*Calypso bulbosa*) (threatened in Wisconsin)
- Drooping sedge (*Carex prasina*) (threatened in Wisconsin)
- False mermaid (*Floerkea proserpinacoides*) (threatened in Minnesota)
- Dotted blazing star (*Liatris punctata* var. *nebraskana*) (endangered in Wisconsin)
- Sweet coltsfoot (*Petasites sagittatus*) (threatened in Wisconsin)
- Bog bluegrass (*Poa paludigena*) (threatened in Minnesota and in Wisconsin)
- Rough-seeded fame flower or prairie fame-flower (*Talinum rugospermum*) (endangered in Minnesota)
- Pygmy snaketail dragonfly (*Ophiogomphus howei*) (endangered in Wisconsin)
- Elktote mussel (*Alasmidonta marginata*) (threatened in Minnesota)
- Mucket mussel (*Actinonaias ligamentina*) (threatened in Minnesota)
- Spectacle case mussel (*Cumberlandia monodonta*) (endangered in Wisconsin, threatened in Minnesota)
- Purple wartyback mussel (*Cyclonaias tuberculata*) (endangered in Wisconsin, threatened in Minnesota)
- Snuffbox mussel (*Epioblasma triquetra*) (endangered in Wisconsin, threatened in Minnesota)
- Salamander mussel (*Simpsonaias ambigua*) (threatened in Wisconsin and in Minnesota)
- Crystal darter (*Ammocrypta asprella*) (endangered in Wisconsin and of special concern in Minnesota)
- Blue sucker (*Cycleptus elongatus*) (threatened in Wisconsin and of special concern in Minnesota)
- River redhorse (*Moxostoma carinatum*) (threatened in Wisconsin)
- Greater redhorse (*Moxostoma valenciennesi*) (threatened in Wisconsin)
- Pallid shiner (*Notropis amnis*) (endangered in Wisconsin and of special concern in Minnesota)

- Gilt darter (*Percina evides*) (threatened in Wisconsin and of special concern in Minnesota)
- Wood turtle (*Clemmys insculpta*) (threatened in Minnesota and Wisconsin)
- Blanding's turtle (*Emydoidea blandingi*) (threatened in Minnesota and Wisconsin)
- Red-shouldered hawk (*Buteo lineatus*) (threatened in Wisconsin and of special concern in Minnesota)
- Trumpeter swan (*Cygnus buccinator*) (endangered in Wisconsin and threatened in Minnesota)
- Red-necked grebe (*Podiceps grisegena*) (threatened in Wisconsin)
- Adder's tongue (*Ophioglossum vulgatum* var. *pseudopod*) (species of special concern in Wisconsin)
- Ginseng (*Panax quinquefolius*) (species of special concern in Minnesota and Wisconsin)
- Barren strawberry (*Waldsteinia fragarioides*) (species of special concern in Minnesota)
- Inornate ringlet butterfly (*Coenonympha tullia*) (species of special concern in Wisconsin)
- Mottled dusky wing butterfly (*Erynnis martialis*) (species of special concern in Wisconsin)
- Splendid clubtail (*Gomphurus lineatifrons*) (species of special concern in Wisconsin)
- Green-faced clubtail (*Gomphurus venticosus*) (species of special concern in Wisconsin)
- Skillet clubtail (*Hylogomphus viridifrons*) (species of special concern in Wisconsin)
- Riverine clubtail (*Stylurus howei*) (species of special concern in Wisconsin)
- Dusted skipper (*Atrytonopsis hianna*) (species of special concern in Wisconsin)
- Cobweb skipper (*Hesperia metea*) (species of special concern in Wisconsin)
- Hoary elfin (*Incisalia polia*) (species of special concern in Wisconsin)
- Henry's elfin (*Incisalia henrici*) (species of special concern in Wisconsin)
- Coral hairstreak (*Satyrrium titus*) (special of special concern in Wisconsin)
- Gopher snake (*Pituophis catenifer*) (species of special concern in Minnesota)
- Louisiana waterthrush (*Seiurus motacilla*) (species of special concern in Minnesota)

Finally, in the upper riverway as of July 1996 there were 21 other rare species of special concern to the states of Minnesota and/or Wisconsin because their numbers are believed to be declining. These species of concern have not yet been listed, but they are under close observation by the state Departments of Natural Resources.

- Dragon sagewort (*Artemisia dracunculus*) (species of special concern in Wisconsin)
- Assiniboine sedge (*Carex assiniboinensis*) (species of special concern in Wisconsin)
- Villous prairie clover (*Dalea villosa*) (species of special concern in Wisconsin)
- Waterwillow (*Decodon verticillatus* var. *laevigatus*) (species of special concern in Minnesota)
- American water-pennywort (*Hydrocotyle americana*) (species of special concern in Minnesota)

CULTURAL RESOURCES

HISTORICAL OVERVIEW

The St. Croix Valley's striking natural characteristics have defined its long and complex history. As a natural passage between the Great Lakes and the Mississippi Valley, the river has for centuries facilitated exploration and commerce, migration and conflict. The valley's natural resource wealth has drawn numerous cultures — Native American, European, and Euro-American — to use and often exploit, the landscape for furs, timber, and water power. Even now, the St. Croix's water quality, recreational potential, and near-wilderness solitude draws visitors by the hundreds of thousands.

When Europeans first came into the area, Native American tribes had inhabited the St. Croix Valley for hundreds of years. In 1680 the French explorer Daniel Greysolon, the Sieur du Luth, canoed upstream on the Brule River, a small stream that flows into the southwestern portion of Lake Superior. From the upper reaches of the Brule, du Luth traversed a short portage to the headwaters of the St. Croix, becoming the first European to travel the river. Du Luth and other French explorers used the St. Croix as their gateway into the Mississippi River.

Over the next century, French voyageurs regularly paddled the waters of the St. Croix, forging relations with the valley tribes and trading European goods for furs. Even after France's defeat in the French and Indian War in 1763, French-Canadian traders maintained their commercial contacts in the St. Croix Valley. The fur trade remained a vital part of life along the St. Croix in the first decades of the 19th century as powerful rival fur companies from Canada competed to monopolize the traffic in furs harvested by the valley's native inhabitants. The Anglo-French colonial competition that played so great a role in the history of 18th century North America also affected life in the St. Croix Valley.

In the mid-17th century, bands of Chippewa arrived in what is now Wisconsin and

Minnesota, displaced from their homelands near the eastern Great Lakes by the powerful Iroquois confederacy. The Chippewa arrived in the St. Croix Valley equipped with firearms acquired in trade with the English and French. Shortly after reaching the St. Croix, the Chippewa found themselves locked in a struggle with the Dakotas, or Sioux, over control of the river. By the 1750s the Chippewa had pushed their enemies out of the St. Croix Valley forever. The Dakotas gradually gave way, retreating west to what would become Minnesota or to the northern plains. For the next century, however, the Sioux and Chippewa fought a series of bloody battles as they raided each other's territory. As intertribal warfare gradually diminished in the 1830s, the Ojibwa faced increasing pressure from new competitors advancing on the St. Croix Valley from the east and south.

American expansion along the Upper Mississippi River and the St. Croix had begun soon after the turn of the 19th century. Lieutenant Zebulon Pike explored the headwaters of the Mississippi in 1805 and also negotiated treaties with the Dakotas to acquire sites along the Mississippi and the mouth of the St. Croix for future military installations. In 1821 the United States Army built Fort Snelling at the confluence of the Mississippi and Minnesota Rivers. The military presence secured a foothold for other Americans who began to move into the area in the early 1830s to compete with British and Canadian fur traders. With the establishment of the Wisconsin Territory in 1836, American exploratory expeditions pushed into the upper reaches of the St. Croix. These first incursions alerted Americans to the immense potential of the St. Croix's white pine forests. Soon after the creation of the Wisconsin Territory, entrepreneurs, many of whom were experienced lumbermen from established timber regions, began small-scale logging and sawmill operations in the St. Croix Valley.

In 1837 the United States and the Chippewa Nation signed a treaty in which the U.S.

purchased approximately 12 million acres in what later became the states of Minnesota and Wisconsin. The primary focus of American negotiators was the acquisition of the region's vast white pine forests, not lands for settlement. Accordingly, they did not insist that the Chippewa relinquish all rights to their homelands. Instead, the treaty stipulated that the tribe would retain indefinitely the rights to "hunt, fish, and gather" in the ceded territories. The Chippewa hold these rights to this day.

By the 1840s numerous small communities like Marine on the St. Croix, Stillwater, Taylors Falls, St. Croix Falls, and Hudson had sprung up around lumber mills on both sides of the river. Much of the forest for the entire length of the St. Croix and Namekagon Rivers was exploited through logging activities. In little more than a decade, mills on the St. Croix were cutting millions of feet of logs. Logging camps were rafting logs in such quantities that the river was frequently jammed for weeks at a time, blocking the river and halting navigation on its lower reaches from the Dalles to the confluence with the Mississippi. In 1883 a colossal logjam at the Dalles lasted 57 days. Ironically, the rush to exploit the great white pine forests threatened to destroy the river's commercial navigation. Throughout the second half of the 19th century, only the Mississippi River carried more logs than the St. Croix.

Because of its enormous resources, the St. Croix Valley played an important part in the post-Civil War urbanization of the West. Many Midwestern cities used the valley as a valuable hinterland, exhausting the St. Croix's vast, old-growth timber reserves to fabricate cheap, high-quality building materials for cities and towns throughout the Mississippi valley. The region's insatiable appetite for wood products put increasing pressure on the St. Croix's timber resources. In 1850 observers had predicted that the valley's forest reserves would last 50 years. By the turn of the century, they were proved correct, as residents began to anticipate the demise of the lumber business. Although the last log run was not made until 1914, most of the seemingly endless stands of white pine had long been reduced to vast wastelands of stumps.

Although the St. Croix's fur and timber resources were depleted, the river continued to serve as a significant natural resource in its own right for both recreational and utilitarian uses. As early as the 1850s, the river was recognized for high-quality recreational hunting and fishing. Soon after the end of the logging era, utility companies constructed dams to generate hydroelectric power. The river's limited navigation and relative freedom from industrial pollution combined to maintain the river's high water quality. The St. Croix retained its integrity as a recreational resource even as dozens of the nation's rivers were virtually destroyed by urban and industrial waste.

By the 1960s, the nation's environment appeared to be teetering on the brink of collapse. Rivers in particular seemed to be at risk. The Colorado River in the Grand Canyon narrowly avoided being dammed for hydroelectric power, and in one of the most highly publicized instances, the heavily polluted Cuyahoga River near Cleveland literally caught fire and burned. To answer a looming crisis, Congress passed the National Wild and Scenic Rivers Act, to preserve rivers remarkable for their scenic, recreational, and primitive qualities. The Upper St. Croix's remarkable features led to its inclusion as one of the eight rivers protected under the original Wild and Scenic Rivers Act.

PHYSICAL RESOURCES

Previous cultural resource work for St. Croix National Scenic Riverway includes numerous archeological surveys, a riverway administrative history (which documents the riverway's conception, establishment, and management), and a list of classified NPS structures. Also, a historic resource study and a cultural landscape inventory are underway.

ARCHEOLOGICAL RESOURCES

Archeological resources reflect use and occupation of the St. Croix Valley for thousands of years. Through archeological surveys from 1976–79, 217 sites were identified on the river-

way. The NPS Midwest Archeological Center conducted an archeological sites inventory in September 1994 that identified dozens of other archeological sites along the entire upper riverway. Other potentially significant archeological sites are associated with aboveground historic resources.

Paleo-Indian sites (9500 –8000 B.C.) have been found near Pine City, Minnesota. Sites from the Archaic period (1000 B.C.) have been found in the St. Croix Falls area. Most documented archeological sites date from the Woodland period (from 500 B.C. to A.D. 1600. A site in the Boyles Creek area dates from 80 to 60 B.C., while one near Phipps Flowage dates from A.D. 550.

Historically, the Chippewa and Dakota occupied the St. Croix Valley. By the 1750s the Chippewa had pushed the Dakota out of the St. Croix Valley, north of St. Croix Falls.

HISTORIC RESOURCES

Numerous structures exist along the Upper St. Croix and Namekagon Rivers that reflect these rivers' long history of recreational use. Riverway structures include cabins, bungalows, and cottages, as well as smaller contributing elements such as walks, privies, wells, and retaining walls. A number of these structures are held under use and occupancy leases and will gradually be acquired by the riverway when their leases expire.

The NPS Midwest Region has begun work on the riverway's list of classified structures to determine which of these resources are eligible for nomination to the National Register of Historic Places and which, if any, are contributing elements to the riverway's significance.

The initial NPS site visit surveyed 60 structures. A total of 37 properties were identified that meet one or more national register criteria. These properties contain 119 contributing structures. However, the NPS specialists compiling the list of classified structures have not completed a riverwide survey and are not prepared to make a definitive statement on the number of structures

that are potentially eligible for the national register. Additional research is required to determine the structures' relationship, if any, to the larger contextual subjects of logging, homesteading, and recreational development. Much of the broader context of the riverway's history will be established in the riverway's forthcoming historic resource study, but it is possible that this study will not be finished before the completion of the list of classified structures.

CULTURAL LANDSCAPES

The St. Croix Valley clearly exhibits the effects of human habitation and alteration of the landscape. Some settings within the riverway may be determined to be important illustrations of the cultural impacts on the riverway. The National Parks Service is required to identify and protect significant historic or cultural landscapes under its jurisdiction.

The NPS Midwest Region has begun work on a cultural landscape inventory. This inventory will identify the significant cultural or historic landscapes within the riverway. This inventory, like the list of classified structures, will in part depend on the historic resource study to establish the appropriate contexts for the evaluation of landscape significance. Again, the historic resource study may not be completed before the cultural landscape inventory.

TRADITIONAL CULTURAL PROPERTIES

As part of the overall effort to identify and inventory significant cultural resources in the riverway, the National Park Service will work with the affected band of the Chippewa Indian Nation and the Minnesota and Wisconsin State Historic Preservation Offices to identify and protect archeological and historic sites, as well as cultural landscapes that have significant associations for the area's traditional cultures.

RIVERWAY ADMINISTRATION AND REGIONAL FACILITIES

RIVERWAY STAFFING

In 1997 the riverway had 23 permanent positions and 26 part-time or seasonal positions that were either management or field operation positions (e.g., visitor information, law enforcement, facility maintenance, or resource protection). The riverway also had eight permanent clerical and administrative support positions. Most of these positions served both the upper and lower riverway, which means they had responsibilities that spanned 227 river miles.

During the past couple of years seasonal staff positions have been significantly cut. Increasing workloads have brought about the need for additional staff. As a result, the staff at St. Croix National Scenic Riverway is under constant pressure to meet all of its responsibilities. Important work in the resource management, maintenance, interpretation, and visitor protection divisions is being delayed or is not occurring. For example, both the Namekagon and Marshland visitor centers could not be adequately staffed so operations were reduced to five days per week.

DISTRICT ADMINISTRATION

For administrative purposes the riverway is divided into three districts. The Namekagon District includes the entire Namekagon River (98 miles) and 20 miles of the St. Croix River from Gordon Dam to the Riverside Landing (where Wisconsin Highway 35 crosses the St. Croix River) for a total length of 118 miles. The Marshland District extends along the St. Croix River from Riverside Landing to the Nevers Dam site, about 71 miles. The Lower District extends 38 miles along the St. Croix River from the Nevers Dam site to the northern city limits of Stillwater, Minnesota, where the federally administered area of the riverway ends and the state administered area begins. However, only

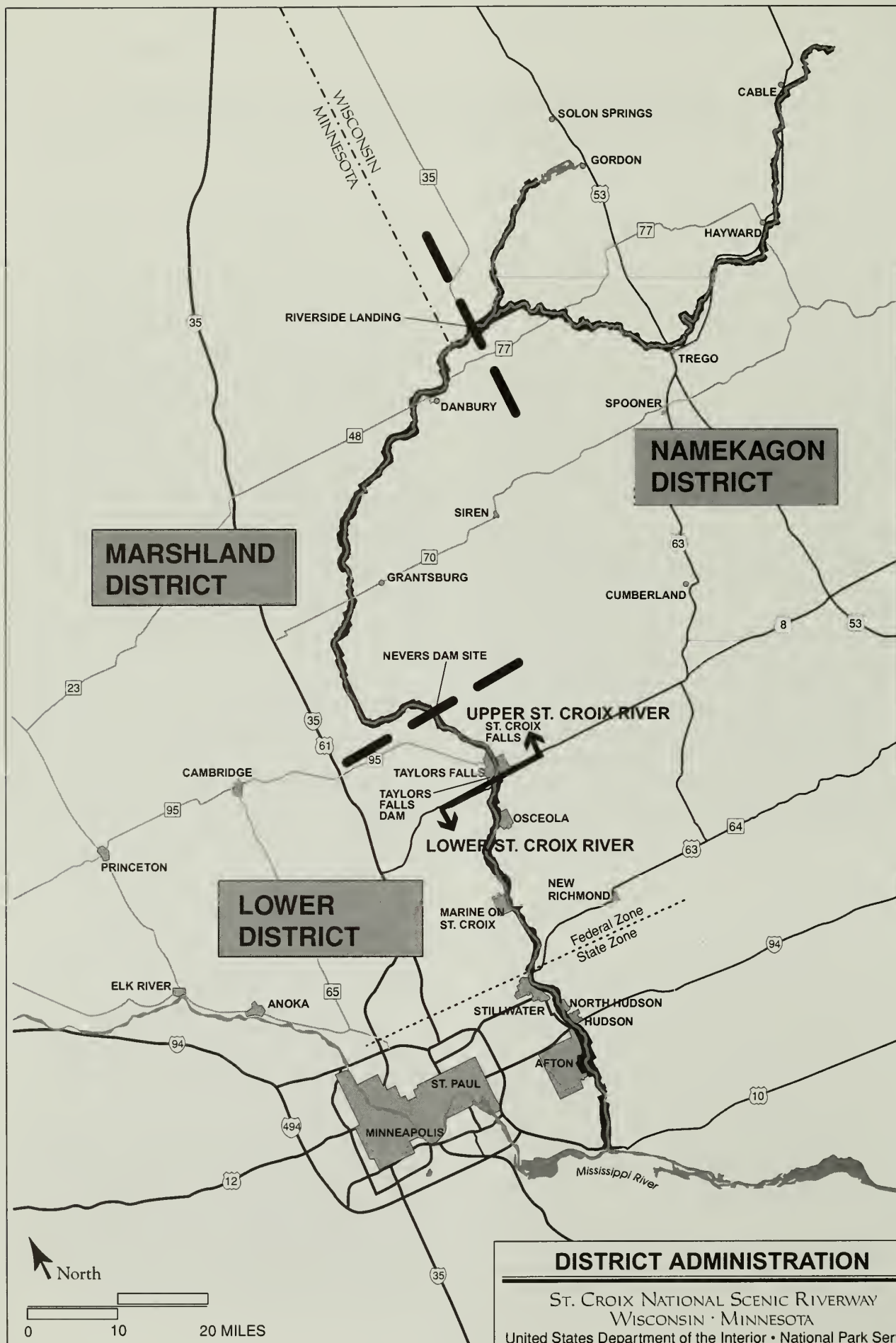
the upper 11 miles (from the Nevers Dam site to the Taylors Falls dam) of the Lower District are addressed in this plan. The remaining 27 miles of the Lower District (from the Taylors Falls dam to the northern city limits of Stillwater, Minnesota) will be addressed in the *Lower St. Croix National Scenic Riverway Comprehensive Management Plan* (see District Administration map)

Most data collected on the riverway is representative of each of the three districts. Unfortunately, in many cases it is not possible to separate the data so that it represents only the portion of the Lower District (from the Nevers Dam site to the Taylors Falls dam) that is addressed in this plan. Data from the three districts will be labeled accordingly.

EXISTING UPPER RIVERWAY FACILITIES

The riverway offers primarily a backcountry experience, and therefore the amount of facility development is quite limited. The major developed areas consist of three visitor centers with adjoining maintenance facilities. There is the Namekagon Visitor Center in Trego, Wisconsin; the Marshland Visitor Center on Highway 70 on the Minnesota shore; and the headquarters/visitor center in St. Croix Falls, Wisconsin. Other facility development is decentralized and small scale and primarily consists of various types of boat accesses and landings, camping facilities, picnic areas, a few trails, small interpretive displays, and roads.

The riverway maintains 43 canoe landings and boat launches, 24 picnic areas, 33 group camping areas, and 69 primitive campsites. Many boat launch areas and canoe landings have toilet facilities and water, and some have adjacent picnic facilities. Camping opportunities vary from primitive campsites accessible only by



canoe with a cleared area, fire grate, and box toilet to developed campsites that are accessible by vehicle and have picnic tables, vault toilets, water, and fire grates. Several of the canoe accessible campsites are maintained by the National Park Service but are actually on state-managed lands. The lower riverway offers boat-in camping at numerous informal sites. Camping opportunities that are accessible by car are available at nearby state parks and private campgrounds.

Trails maintained by the riverway consist of the Trego ski trail, the Trego nature trail, Munger Trail, Indianhead Trail, Court Oreilles Trail, and the Sandrock Cliff's trail. The riverway also maintains a number of roads, parking lots, and bridges. There are also numerous facilities managed by the states and local communities that complement those offered by the riverway (please see "Other Recreational Facilities within or Directly Adjacent to the Upper St. Croix National Scenic Riverway" section).

Tables 6 and 7 present a general inventory of the infrastructure and facilities that provide public access and support the recreational use of the riverway.

OTHER RECREATIONAL FACILITIES WITHIN OR DIRECTLY ADJACENT TO THE UPPER ST. CROIX NATIONAL SCENIC RIVERWAY

Many non-NPS facilities contribute directly to the enjoyment of the riverway. Many of these facilities are in state or county areas that are either within or directly adjacent to the riverway's boundaries (see Recreational Opportunities map). Also, several communities along both sides of the river provide parks, recreational sites, and facilities that provide opportunities for enjoying the river environment. In many cases the recreational opportunities of these areas complement those offered in the riverway. The non-NPS areas typically offer

more land-based recreational opportunities (e.g., hiking, bicycling, equestrian, and snowmobile trails) and more visitor support facilities (e.g., showers bicycle rentals, full-service campgrounds), whereas the riverway focuses primarily on water-oriented activities (e.g., canoeing and fishing) and has fewer visitor support facilities. Many of these adjacent areas offer views of the river plus river access and opportunities for canoeing, boating, fishing, inner tubing, swimming, camping, hiking, horseback riding, bicycling, snowmobiling, cross-country skiing, and environmental education. Many of the major contributing facilities are outlined below and the areas are organized geographically north to south.

CHEQUAMEGON NATIONAL FOREST — U.S. FOREST SERVICE

Chequamegon offers semiprimitive, nonmotorized recreational opportunities including camping, hiking, fishing, and horseback riding and includes the Rainbow and Porcupine Lake Wilderness and the North Country National Scenic Trail.

GORDON DAM PARK — DOUGLAS COUNTY, WISCONSIN

This park has 33 campsites (12 with electricity) and a boat and canoe launch.

ST. CROIX STATE FOREST — MINNESOTA DEPARTMENT OF NATURAL RESOURCES

There are several recreational features in this state forest — Boulder Campground with 19 campsites, picnic areas, toilets, and water; Tamarack River Equestrian Camp with a parking area and toilets, but no water; a section of the Willard Munger State Trail (used primarily for snowmobiling but also open for all nonmotorized recreational uses); 7 miles of equestrian trails; 21 miles of snowmobiling trails; and boat ramps.

TABLE 6: UPPER ST. CROIX NATIONAL SCENIC RIVERWAY ROADS, TRAILS, BRIDGES, AND PARKING LOTS

Item	District ⇒	Namekagon	Marshland	Lower *	Total
Roads	NPS	10.25 miles	6.35 miles	0	16.6 miles
	Non-NPS	51.72 miles	21.0 miles	8.5 miles	81.22 miles
Trails	NPS	5.65 miles	21.0 miles	2 miles	28.65 miles
	Non-NPS	58.55 miles	23.6 miles	0	82.15 miles
Bridges	NPS	1	0	0	1
	Non-NPS	31	5	0	36
Parking Lots	NPS	120,340 sq ft	141,100 sq ft	50,000 sq ft	311,440 sq ft
	Non-NPS	10,000 sq ft	6,500 sq ft	27,500 sq ft	44,000 sq ft

SOURCE: St. Croix and Lower St. Croix National Scenic Riverway's *Statement for Management*, 1991

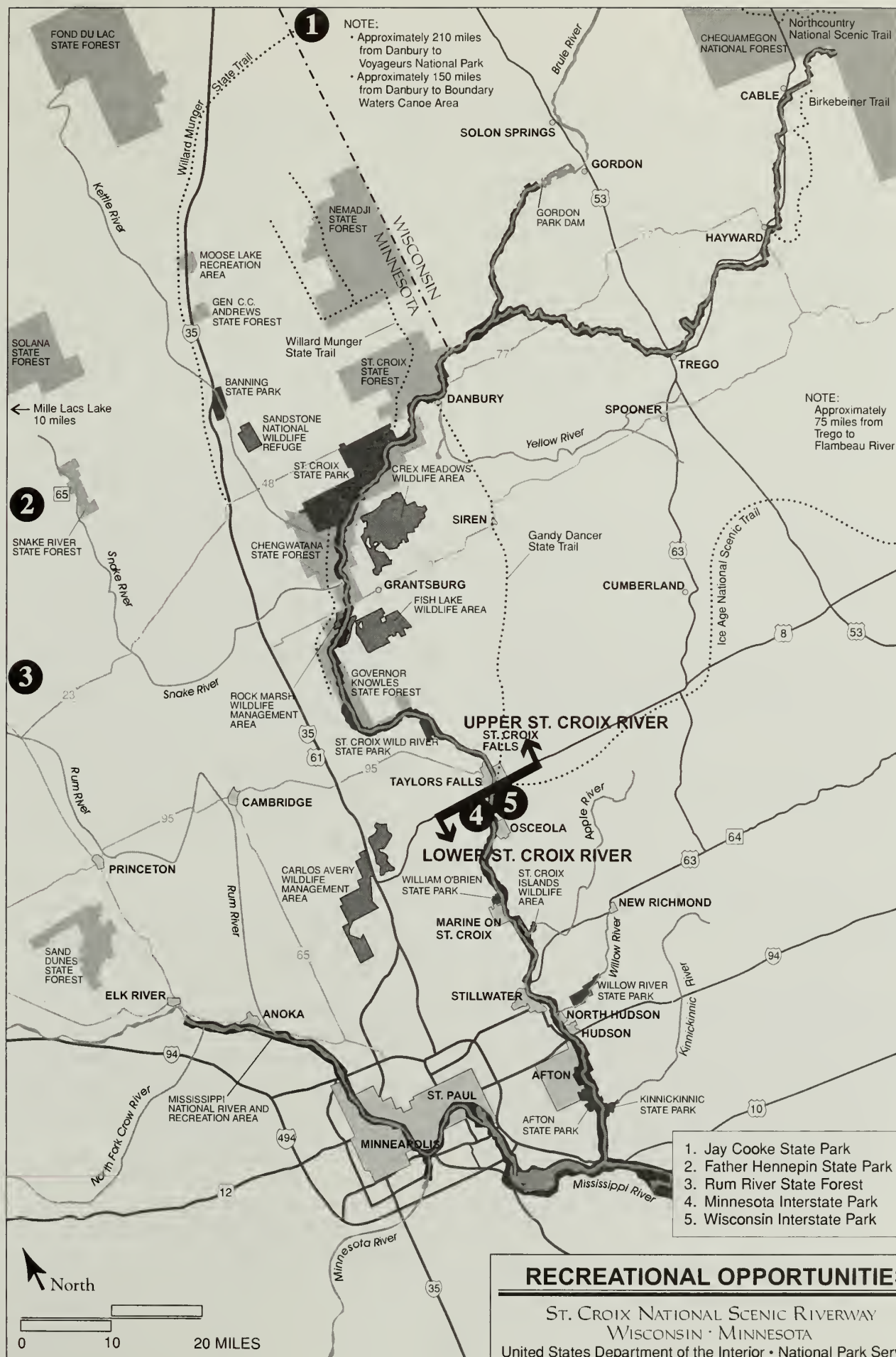
* Information reflects on an 11-mile section of the Lower District from the Nevers Dam site to the dam at Taylors Falls.

TABLE 7: UPPER ST. CROIX NATIONAL SCENIC RIVERWAY PICNIC AREAS, CAMPGROUNDS, AND LAUNCH RAMPS

Item	District ⇒	Number/ Area	Namekagon	Marshland	Lower *	Total
Picnic Areas	NPS	Number	4	1	3	8
		Area	0.12 acre	0.03 acre	30 acres	30.15 acres
	Non-NPS	Number	2	1	1	4
		Area	0.02 acre	0.05 acre	2 acres	2.07 acres
Campsites	NPS	Number	70	23	9	102
		Area	61 acres	42 acres	2 acres	105 acres
	Non-NPS	Number	1	0	0	1
		Area	12.9 acres	0	0	12.9 acres
Launch Ramps	NPS	Number	0	5	2	7
		Area	0	na	na	na
	Non-NPS	Number	0	5	2	7
		Area	0	na	na	na

SOURCE: St. Croix and Lower St. Croix National Scenic Riverway *Statement for Management*, 1991.

* Information reflects on an 11-mile section of the Lower District from the Nevers Dam site to the dam at Taylors Falls.



ST. CROIX STATE PARK — MINNESOTA DEPARTMENT OF NATURAL RESOURCES

This park has 4 canoe campsites with water and toilets; 3 primitive canoe campsites; 6 canoe landings; a swimming beach; a primitive group camp for up to 200 campers with water and toilets; 3 modern group centers for up to 395 campers; 42 campsites with electric hook-ups and a trailer dump station; 50 picnic tables, 2 picnic shelters with fireplaces; toilets; shower facilities; canoe and bicycle rentals; 127 miles of foot trails; 21 miles of ski trails; 6 miles of paved bike trails; 75 miles of horseback and snowmobile trails; and winter campsites (12 with electrical hook-ups).

CHENGWATANA STATE FOREST — MINNESOTA DEPARTMENT OF NATURAL RESOURCES

This state forest has Snake River Campground (26 sites) with water and outhouses; toilets; 20 miles of hiking and ski trails; 20 miles of snowmobiling trails; Willard Munger State Trail (used primarily for snowmobiling but also open for all nonmotorized recreational uses); and hunting, fishing, backpack camping, and a boat ramp.

GOVERNOR KNOWLES STATE FOREST — WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Interpretive, hiking, horseback, snowmobile, and cross-country ski trails, as well as group camping and a canoe landing are available at this state forest. During summer 1997 construction was started on a rustic, 30-site campground (no showers or electricity) near Highway 70. In the future a picnic area and interpretive trails will be added.

ST. CROIX WILD RIVER STATE PARK — MINNESOTA DEPARTMENT OF NATURAL RESOURCES

This state park has 96 semimodern campsites with showers, 8 canoe campsites, 8 backpack campsites, a trailer dump station, picnic grounds with a shelter, 2 river accesses; year-round trail center, visitor center; 35 miles of hiking and cross-country ski trails, 18 miles of horseback riding trails, a guest house, and 2 camping cabins.

REGIONAL RECREATIONAL ACTIVITIES AND FACILITIES

In addition to adjacent facilities, there is a wealth of diverse outdoor recreational opportunities in the St. Croix National Scenic Riverway corridor and throughout the Minnesota–Wisconsin region. There are more than 250 public access areas including state, county, and municipal parks; national, state, and county forest lands; national, state, and county wildlife areas; natural areas; boat and canoe access for numerous rivers and lakes; snowmobile, cross-country skiing, hiking, biking, equestrian, and ATV trails; historic sites; public and private camping opportunities; recreational areas; scenic overlooks; and environmental education facilities.

Within 50 miles of the riverway there are numerous other state-managed recreational areas including 10 state parks and a state recreation area. These include Jay Cooke, Banning, Father Hennepin, Mille Lacs Kathio, Interstate, William O'Brien, and Afton State Parks and Moose Lake Recreation Area in Minnesota, and Interstate, Willow River, and Kinnickinnic State Parks in Wisconsin. These areas provide a wide variety of recreational opportunities and facilities. Boating, camping, canoeing, cross-country skiing, fishing, hiking, horseback riding, picnicking, swimming, snowmobiling are some of the recreational activities supported by these state-managed recreation areas.

Primitive tent, trailer, canoe, and group camping facilities are also available. Some campsites also provide electrical hook-ups, trailer dump stations, flush toilets, and showers. Other facilities include picnic areas (some with picnic shelters), river access sites (launching ramps), a fishing pier, and interpretive facilities including one amphitheater. Several miles of cross-country skiing, interpretive, hiking, horseback riding, and snowmobile trails are provided and maintained for public use. These state areas, in particular, offer a lot of support facilities for the recreational visitor.

Wildlife management areas (Minnesota) and wildlife areas (Wisconsin) typically offer wildlife viewing, hunting, trapping, and picnicking opportunities. There are several of these areas near the riverway including Danbury, Crex Meadows, Fish Lake, Kiezer Lake, Amsterdam Sloughs, McKenzie Creek, Clam River, and St. Croix Islands wildlife areas; and Mille Lacs, Rock Marsh, and Carlos Avery wildlife management areas. Hunting opportunities can be also found in several of the surrounding national, state, and county forest lands; county lands such as Burnett County Public Hunting Grounds; and Polk County hunting and fishing areas. Wildlife viewing and hunting opportunities can also be found in the vicinity's national wildlife refuges, Sandstone and Sherburne.

In addition to hunting, many national, state, and county forests near the riverway provide other outdoor recreational opportunities, including Fond du Lac, Solana, Nemadji, General C.C. Andrews, Snake River, Rum River, and Sand Dunes state forests in Minnesota, and Brule River State Forest in Wisconsin. These areas provide interpretive, hiking, horseback, snowmobile, and cross-country ski trails; multiple camping opportunities including backpacking opportunities and one equestrian camp; river access and river views; fishing; swimming areas; and picnic areas.

There are also long-distance trails in the riverway vicinity that connect various areas or, in some cases, traverse several states. The Willard Munger State Trail is a multiuse trail being

developed from Duluth to the Twin Cities. The east section of this trail is primarily a snowmobile trail, with some summer equestrian / hunting use. The west section is a paved rail trail that will provide a hiking, snowmobiling, cross-country skiing, and horseback riding route. The Gandy Dancer State Trail offers 50 miles of bicycling, hiking, snowmobiling, and ATV use from Danbury to St. Croix Falls along the former Soo Line railbed.

The Tuscobia– Park Falls State Trail is a 76-mile abandoned railroad grade that is now open to bicyclists and snowmobilers. The western portion of this trail forms part of the Ice Age National Scenic Trail. The Ice Age Trail, about 500 miles long, is for hiking and horseback riding through the glacial landscape of Wisconsin. The 3,200-mile North Country National Scenic Trail, from Crown Point, New York, to Lake Sakakawea, North Dakota, offers hiking, backpacking, horseback riding, mountain biking, snowshoeing, camping, fishing, and wildlife viewing. Also, the Birkebeiner Trail is a long-distance cross-county ski trail of 32 miles that hosts the internationally renowned, annual cross-country Birkebeiner Race.

There are many lakes, rivers, and streams near the riverway that provide opportunities for various types of water-oriented recreational activities, some of which are offered in the riverway and some of which are not. In Minnesota, the Kettle, the Upper Mississippi, Rum, and Snake Rivers offer a wide range of opportunities for water recreation, viewing wildlife, and solitude. In Wisconsin, the Bois Brule and Yellow Rivers are two of the waterways that can provide water recreational experiences similar to the St. Croix and Namekagon Rivers. The Bois Brule River is noted for its trout fishing, scenery, and rapids. The Apple River is very popular with inner tubers. The Flambeau is a popular canoeing river in Wisconsin, but it differs from the riverway by offering primarily whitewater experiences. The Kinnickinnic River is known for its trout fishing.

The upper portions of the Lower St. Croix offer water-based activities in a natural setting. The

mighty Mississippi and Minnesota Rivers, and portions of the Lower St. Croix, offer water-oriented experiences in a large river setting, including large watercraft and shipping vessels. The Mississippi National River and Recreation Area provides opportunities for enjoying 72 miles of river environment in the Twin Cities metropolitan area. In Minnesota the large Mille Lacs Lake provides various activities including personal watercraft opportunities. Both Minnesota and Wisconsin have numerous small lakes with public access, such as Loyhead Lake and Sawmill Lake in Washburn County.

Scattered throughout the area are smaller recreational entities that add to the vicinity's diverse outdoor recreational opportunities. Examples include the Totogatic, Beaver Brook, and Nordic Woods ski trails and Lampson Moraine Pines State Natural Area in Washburn County; and Lucius Woods County Park, the Bird Sanctuary Park, Bass Lake, and Mooney Dam County Park in Douglas County. The area also has many privately owned and operated camping opportunities. Thus, opportunities for

enjoying the river environment and the region's natural resources are readily available.

Snowmobiling opportunities abound in the states of Wisconsin and Minnesota, and there are both private and public trails. These trails primarily traverse public access areas including public rights-of-way along roadways; and national, state, and county lands (including parks, forests, and wildlife areas). Designated snowmobile crossings through the riverway connect the elaborate network of trails that surround it.

Popular but distant recreational opportunities can be found at the Boundary Waters Canoe Area (managed by the U.S. Forest Service) and Voyageurs National Park. The Boundary Waters Canoe Area offers primitive, nonmotorized recreational opportunities in a wilderness environment. The area provides multilake, multiday canoeing and primitive camping. In contrast, Voyageurs mainly offers opportunities for motorized use including motorboating and snowmobiling, with some sailing and canoeing opportunities available in the more protected areas of the park.

VISITOR USE

VISITOR EXPERIENCES AND INTERPRETIVE PROGRAMS

The St. Croix and Namekagon Rivers and their surrounding communities and landscapes offer opportunities to experience quiet, solitude, and beauty in a northwoods environment; enjoy a variety of recreation activities; and view natural waterway environments that create a sense of wildness in a region that is becoming increasingly urban.

The entire riverway provides recreation to nearly one-half million people each year, primarily repeat users from regional urban centers. Local residents, many of whom do not realize that the St. Croix and Namekagon Rivers are a unit of the national park system, have also enjoyed long traditional ties to riverway resources.

The primary user experiences within the upper riverway are on the water using a variety of watercraft — motorboat, canoe, and inner tubes. The waters are easily negotiable by most people, even those with limited boating experience. Safe, short canoe trips offer opportunities for socializing with friends and family while enjoying the riverway's natural features. More energetic users often complete canoe and camping trips lasting several days. The diversity and varying numbers of water surface users increases the potential for conflicting visitor experience expectations concerning speed, noise, and congestion.

A significant number of land-based recreationists in the riverway participate in sightseeing, walking/hiking, wildlife viewing, hunting, and camping. Winter activities include cross-country skiing, snowshoeing, and snowmobiling. People who participate in winter activities often find opportunities to experience a high degree of quiet and solitude. Summer activities frequently offer opportunities to experience those qualities in much of the riverway, although increasing

use, especially on weekends, is decreasing the amount of time such opportunities are available. The riverway is relatively accessible. Its 43 canoe landings and boat launches enable boaters to get onto the water. There are 24 picnic areas, 33 group camping areas, and 69 primitive campsites that provide opportunities for people to enjoy the river environment. Still, some sections of the river have few access points or facilities, providing visitors with opportunities for quiet and solitude.

Differences in philosophy and regulations among a variety of riverway management entities, including the National Park Service, state parks and forests, and private owners, affect visitor experiences. Each managing entity posts its own signs and enforces its own regulations.

The visitor's first contact with the river may occur at many locations along the riverway's 200-mile length. Providing information or interpretation to all visitors is a formidable task. Visitors may secure limited riverway information from numerous state and local information facilities throughout the region. The National Park Service has three visitor centers in the upper riverway. The Namekagon and Marshland visitor centers provide information, programs, and orientation to the riverway during the summer. The St. Croix Falls visitor center is open year-round. About 45% of upper river visitors use the visitor centers.

The Marshland visitor center is the only NPS building designed as a visitor contact facility. The riverway headquarters was originally designed as a motel, and the Trego visitor center was designed and used as a tavern; they do not ideally function as visitor use spaces.

Interpretation at some landings along the river is provided by wayside exhibits. Signs and bulletin boards at access points provide safety and orientation information. A folder with a map

provides minimal interpretation of riverway themes, and several site-specific publications focus on recreational uses in sections of the riverway. These publications are distributed at visitor centers, brochure boxes attached to bulletin boards, and commercial outfitter facilities. More detailed interpretive publications may be purchased from cooperating association sales areas at visitor centers.

Interpreters maintain visitor centers and interpretive media and activities throughout the riverway's 200-mile length. In addition to interpretive duties, they manage the riverway's cultural resources, public information, fee collection, volunteer, and cooperating association programs.

The National Park Service has formed partnerships with Minnesota, Wisconsin, counties, towns, and private and commercial organizations to enhance public contact opportunities. NPS interpretive staff also participate in the St. Croix Valley Interpreters Association to share resources and coordinate programming and publications with adjoining state-managed areas. Still, only about 5% of riverway users join in NPS ranger-led activities. A successful educational outreach program and roving interpretation provides contacts for many boaters and local residents who do not participate in other interpretive activities.

EXISTING VISITOR USE AND PATTERNS

Visitor use and patterns of use are described in the following sections. This information provides background for understanding levels of use and impacts of this use on the riverway's resources and the visitors' experiences.

Visitor use data has been collected for many years for the entire riverway, which consists of the Namekagon, Marshland and Lower Districts (see "District Administration" section). The official visitor use figures for 1982 through 1995 are displayed in table 8. These data are the reported visitation for the entire riverway, and

the data cannot be separated into the upper and lower riverways. The following tables note which areas the data pertain to. However, most of this use occurred in the lower riverway.

As part of the NPS Public Use Statistics Program Center's audit program, the public use reporting and counting instructions were changed, starting in January 1993, for St. Croix National Scenic River. This means that visitor use data for 1993 and later years is not comparable to earlier years.

Visitation figures for the two units of the riverway are not shown separately prior to 1993 due to the changes in the manner in which visitor use was determined.

Table 9 displays the total reported visitor use separated by districts beginning with 1993. Figure A represents recreational use in the four most recent years. Visitor use data was collected by district and combined to arrive at the annual total for the riverway. In 1993, 1994, 1995, and 1996 visitation to the Namekagon and Marshland Districts had been 15.0%, 14.3%, 13.6%, and 12.9%, respectively, of the total reported for the entire riverway.

The comparatively low level of visitor use for the Namekagon and Marshland Districts relative to the Lower District is a defining characteristic of the riverway (table 9). The upper riverway is somewhat distant (two to four hours drive one way) from the Minneapolis-St. Paul metropolitan area. The upper riverway provides a much less crowded, more peaceful, quiet and restful, recreational/natural atmosphere in a rural environment.

Urban sprawl will continue to convert open-space land into residential and commercial uses. The riverway and nearby state lands may eventually be islands of open space in a sea of development. Development and pressures external to the riverway could have serious impacts on water quality and natural and cultural resources.

TABLE 8: UPPER AND LOWER ST. CROIX NATIONAL SCENIC RIVERWAY TOTAL ANNUAL VISITATION 1982–95^a

Year	Total Recreation Visits ^b	Year	Total Recreation Visits ^b
1982	445,183	1989	553,779
1983	440,016 ^c	1990	489,274
1984	462,922 ^c	1991	468,790
1985	439,033	1992	500,960
1986	438,772	1993	373,518 ^d
1987	625,549	1994	424,835
1988	529,414	1995	458,525
		1996	422,653

SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

a. Data includes visitation to all three districts of the riverway:

b. Recreation visits are the entries of persons, for any part of a day, onto lands or waters administered by the National Park Service for recreation purposes.

c. An authorized change was made resulting in these numbers.

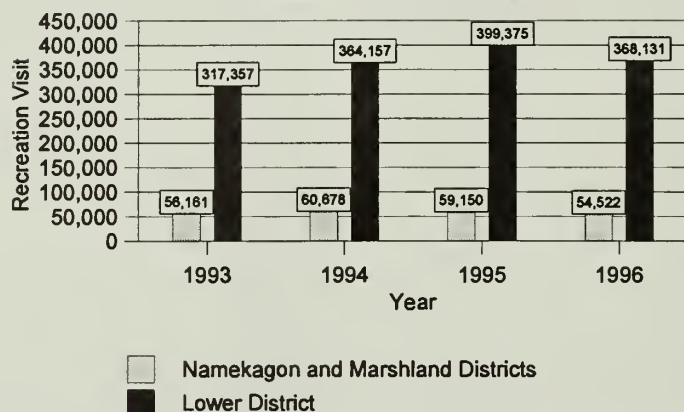
d. Public use reporting and counting instructions were changed. Visitor use data for 1993 and later years is not comparable to earlier years.

TABLE 9: UPPER AND LOWER ST. CROIX NATIONAL SCENIC RIVERWAY ANNUAL VISITATION 1993–96

Year	Namekagon and Marshland Districts		Lower District		Total Recreation Visits
	Recreation Visits	Percent of Total	Recreation Visits	Percent of Total	
1993	56,161	15.0%	317,357	85.0%	373,518
1994	60,678	14.3%	364,157	85.7%	424,835
1995	62,268	13.6%	396,257	86.4%	458,525
1996	54,522	12.9%	368,131	87.1%	422,653

SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

Figure A. Upper and Lower St. Croix National Scenic Riverway
Annual Recreation Visits 1993-1996



SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

MONTH-BY-MONTH DATA AND ANALYSIS

The riverway is open all year. In 1996 the monthly visitation to the riverway exhibited the expected *head and shoulders* pattern common to most national park system units (figure B). Visitation is very light in the winter months; it starts to rise in April with the coming of spring. The peak use months are May through October; with August being the month of heaviest use. During August 1996, the Namekagon and Marshland Districts averaged 437 recreation visits per day. In September visitation fell to less than one-half of July's total. No doubt this is due to the summer's end and the beginning of school once again. There is some visitation in the fall, mostly on weekends, as long as the weather is good. Once the snows and freezing temperatures come, visitation is minimal. During January through April the riverway averaged under 20 recreation visits per day.

OVERNIGHT USE

Primitive style backcountry-canoe camping is the primary type of camping experience offered in the upper riverway. During peak use periods some visitors may not be able to find a campsite after midday. This situation indicates that on

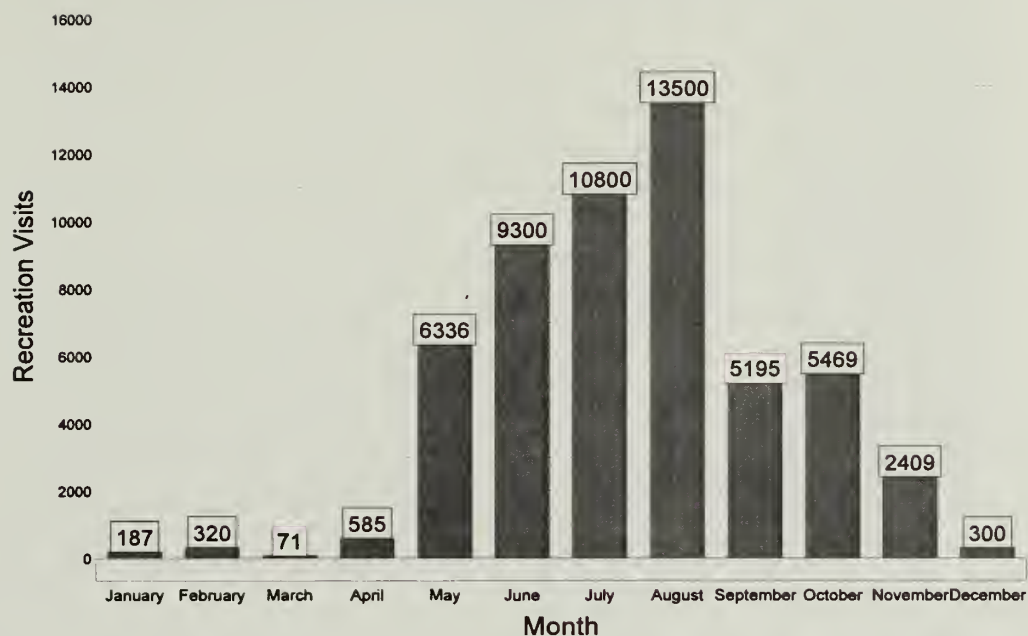
some days the demand for campsites is greater than the supply.

Within the St. Croix National Scenic Riverway there are approximately 102 designated primitive campsites. In the lower riverway, boat-in camping is available at numerous informal sites. Camping opportunities that are accessible by car are limited within the riverway, but such experiences are available at nearby state parks and private campgrounds.

Camping use is reported as overnight stays within the riverway. An overnight stay is one visitor spending one night within the riverway for recreational purposes. Overnight stays are counted separately from recreational visits. However, overnight use of the riverway accounted for only a minor portion of the entire riverway's recreational use (tables 10 and 11). Overnight stays for the Namekagon and Marshland Districts in 1995 are presented by month in table 11.

There were 13,123 overnight stays in the Namekagon and Marshland Districts in 1995, which was 44.5% of the total overnight use of the upper and lower riverways. For January, February, March, November, and December, overnight use was minimal or nonexistent.

**Figure B. Namekagon and Marshland Districts
Recreational Use by Month for 1996**



SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

**TABLE 10: UPPER AND LOWER ST. CROIX NATIONAL SCENIC RIVERWAY
TOTAL BACKCOUNTRY CAMPING (OVERNIGHT STAYS) 1982 – 96**

Year	Total Overnight Stays	Year	Total Overnight Stays
1982	37,570	1989	49,467
1983	45,284	1990	31,846
1984	37,096	1991	33,312
1985	42,016	1992	34,466
1986	35,099	1993	30,530
1987	42,434	1994	31,904
1988	48,403	1995	30,771
		1996	29,474

SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

**TABLE 11: NAMEKAGON AND MARSHLAND DISTRICTS
BACKCOUNTRY CAMPING (OVERNIGHT STAYS) FOR 1996 BY MONTH**

Month	Namekagon District	Marshland District	Total Overnight Stays
January	0	0	0
February	0	0	0
March	0	0	0
April	8	65	73
May	101	1,160	1,711
June	379	2,140	2,519
July	474	2,093	2,567
August	383	2,992	3,375
September	42	1,280	1,332
October	30	1,385	1,415
November	1	140	141
December	0	0	0
District Totals	1,418	11,705	13,123

SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

VISITOR USE PROFILE

According to the riverway's 1991 *Statement for Management*, the peak season for riverway use is May 15 to September 30. The peak weekends during the year are Memorial Day, the Fourth of July, and Labor Day. In fact, most use along the riverway occurs on weekends, between noon Friday and 6:00 P.M. Sunday.

Visitor use on the busy Labor Day weekend may be influenced by the start of school and the Minnesota state fair. The Labor Day weekend occurs during the run of the Minnesota state fair and the start of school in Wisconsin. These factors may combine to reduce visitation in the riverway during the Labor Day weekend. Later, the fall colors and hunting season bring people back to the riverway until winter sets in.

Local weather conditions can greatly influence the use of the river. Inclement weather and weather forecasts predicting bad weather will result in fewer visitors using the river. Bad weather and ice on the riverway prohibit canoeing and boating during the long winter.

Cross-country skiing, snowmobile use, and other winter activities then will occur.

Visitors' average length of stay at the riverway varies by the activities in which they participate and the district where the activity occurs (table 12). The average for overnight camping is about two days or the equivalent of a long weekend, Friday afternoon to Sunday evening. The shortest average length of stay is for picnicking in the Namekagon District.

PRINCIPAL KINDS OF ACTIVITIES

The primary recreational activities on the Upper St. Croix and Namekagon Rivers are canoeing, fishing, and primitive camping. These two rivers offer recreational experiences in a largely undeveloped setting. Most of the primitive campsites within the riverway are accessible only by canoe or other human-powered watercraft.

Picnicking, inner tubing, swimming/wading, hiking, and some hunting are also activities that are experienced within the riverway. Hiking use

TABLE 12: NAMEKAGON AND MARSHLAND DISTRICTS AVERAGE LENGTH-OF-STAY BY CATEGORY

Category	Average Length of Stay	
	Namekagon District	Marshland District
Canoe overnight stays	50 hours	50 hours
Canoe day use	9 hours	6 hours
Anglers	6 hours	2.5 hours
Picnickers	2 hours	2.5 hours
Hikers/hunters	4 hours	2.5 hours
Skiers/snowmobilers	3 hours	2.5 hours

SOURCE: National Park Service, Washington Office, Public Use Statistics Program Center

is light due to the limited number of trails. The Trego and Indianhead Flowages (reaches of deep, slack water created by the Trego dam and St. Croix Falls hydroelectric dam) offer powerboating, waterskiing, and some deepwater fishing opportunities.

There are concerns about personal watercraft and jet units and their impacts on resources and visitor experiences in the riverway. Current use is very limited, but there is increasing pressure for more of this type of activity.

With the apparent increasing numbers of outfitters, more inner tubers and canoeists are using the riverway and are perhaps threatening the resources and visitor experiences.

Cross-country skiing and snowmobiling are also available seasonally as snow conditions permit. Snowmobile use is primarily along designated river crossings. The American Birkenbeiner uses a part of the riverway along the Namekagon River; this major winter cross-country ski event attracts 7,000–10,000 skiers in late February. Winter use of two NPS cross-country ski trails is increasing. However, the primary recreational attraction of this 200-mile long combination of rivers is the opportunity to canoe in a natural setting out of sight and sound of most human developments.

PROJECTIONS OF POTENTIAL VISITOR USE

Visitor use trends for the entire riverway were established by examining visitor use data and determining the average annual percent change in visitation to the riverway as a whole for the years 1982–92 and the average annual percent change in visitation to the Namekagon and Marshland Districts for the years 1993–95. Although the annual visitation figures before 1993 are not comparable to the more recent data (see table 8), it is believed that the average percentage changes represent realistic trends. An average of 13.95% of the total visitor use occurred in the Namekagon and Marshland Districts and 86.05% of the total occurs in the Lower District for 1993, 1994, 1995, and 1996. For the purpose of forecasting future riverway use, it is assumed that these proportions would remain the same in the near future.

Riverway use is affected by a variety of factors, e.g., population, income, weather, distance from the riverway, travel time, and visitor perceptions of the experiences that are offered. Forecasting visitor use for the upper riverway was achieved by selecting high, medium, and low growth rates and using a simple straight line projection method.

The average rate of visitation growth for both the Upper and Lower St. Croix National Scenic River during the years 1982 through 1992 was a positive 2.2%. However, visitation ranged from a +45.6% (1987) to a -15.4% (1988). The average indicates a modest level of growth in visitation over a long time period, while the wide range indicates that year-to-year estimates of visitation would be difficult to accurately predict. Visitation increased 13.7% between 1993 (counting and reporting procedures were changed effective Jan. 1, 1993) and 1994. Visitation increased 7.9% between 1994 and 1995. Visitor use of the entire riverway decreased -7.8% from 1995 to 1996. In general, visitor use of most parks within the national park system is expected to continue to increase over time.

Due to time and resource constraints, forecasted use of the riverway is based solely on past use, which is projected forward over time. This method implies that whatever factors influenced visitation in the past will continue to do so in the future, and that the changes in those factors will follow the patterns of the past. Extrapolation of a historic trend forecasts trend patterns and does not consider the causes of the trend.

Forecasting visitor use for the upper riverway was achieved using simple straight-line projection methods. Recent history has visitation increasing by 8.0% from 1993 to 1994, increasing by 2.6% from 1994 to 1995, and decreasing by 12.4% from 1995 to 1996. It is assumed that visitation, if unmanaged, would probably increase over the long term because this seems to be the general trend for most units in the national park system. However, use of the riverway could sporadically decline as it did from 1995 to 1996. To account for these possibilities, a range of values, for short-term visitor growth, is estimated to be -1.0%, +5.0%, and a +10.0%. These growth factor rates provide a range of projected visitation figures that is considered reasonable over the next few years. The further out in time one projects, the greater the range between the high and low projections and the less reliability that can be ascribed to them.

Forecasting in this manner is subject to a high probability of error because the method used is simplistic (a straight-line projection), relatively few data points are available to establish the trend, and there is no cause and effect relationship between past use and future use. The addition of another year's visitation figures (additional data) may affect the projections. For these reasons, a range of values were reported and extreme caution is warranted when interpreting and using the results.

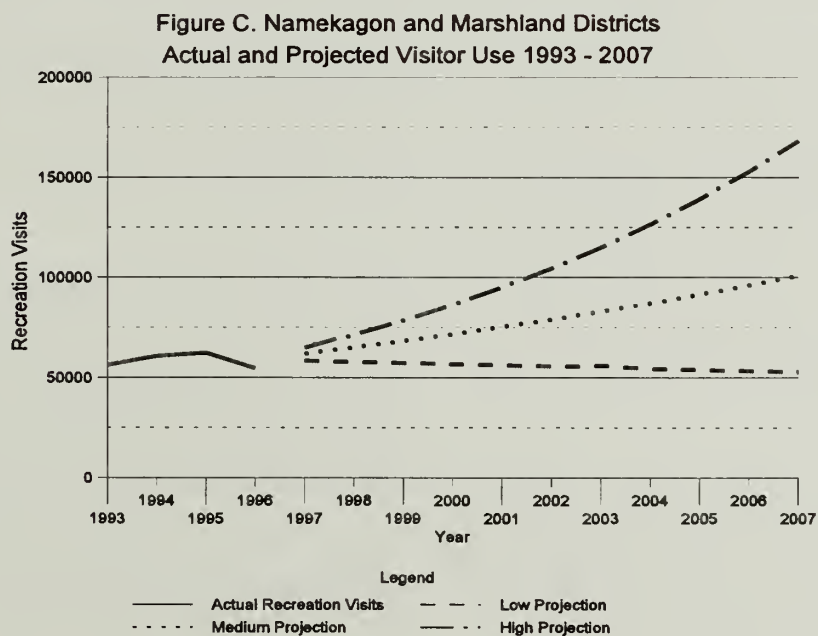
The high forecast projects an increase to nearly 168,000 recreation visits by the year 2007, about a 300% increase over the recreation use in 1996. Such high levels of visitation could only be accommodated within the riverway through significant changes in resource conditions and visitor experiences within the riverway. On the other hand, a steady decrease in visitation to the riverway, as shown in the low projection, is not expected either. It is expected that visitation would reach a plateau, with some fluctuation, and level off. In all likelihood, visitor use of the riverway would have to be managed at a level that is sustainable both in terms of protecting the resource and providing quality visitor experiences. Uncontrolled growth in visitor use would have serious negative impacts upon the resources of the park and the quality of the visitor experience. Table 13 and figure C present these projected visitation figures.

The riverway's recent levels of use are considered acceptable. Some growth may be allowable. However, the long-term continuation of the current practice of allowing visitors free and unlimited access would eventually mean that the NPS staff would no longer be able to successfully achieve the purposes of the riverway. These projections indicate that the riverway would soon have to begin to more intensively manage visitor use to achieve the goals of preserving the resources of the riverway and maintaining the current high-quality visitor experiences offered by the riverway.

TABLE 13: NAMEKAGON AND MARSHLAND DISTRICTS POTENTIAL RECREATIONAL USE 1996 – 2006

Year	Projected Recreation Visits		
	Low (-1%)	Medium (+5%)	High (+10%)
1997	58,400	61,900	64,900
1998	57,800	65,000	71,300
1999	57,200	68,300	78,500
2000	56,600	71,700	86,300
2001	56,100	75,300	95,000
2002	55,500	79,000	104,500
2003	55,000	83,000	114,900
2004	54,400	87,100	126,400
2005	53,900	91,500	139,000
2006	53,300	96,000	152,900
2007	52,800	100,800	168,200

SOURCE: National Park Service, Denver Service Center, Resource Planning.



Source: National Park Service, Washington Office, Public Use Statistics Program Center, and Denver Service Center, Resource Planning.

SOCIOECONOMIC ENVIRONMENT

REGIONAL SETTING AND LAND USE CHARACTERISTICS

The eight counties adjacent to the riverway (comprised of Chisago and Pine Counties in Minnesota and Bayfield, Burnett, Douglas, Polk, Sawyer, and Washburn Counties in Wisconsin) are largely rural in character. Small towns are connected by state and local roads but are separated by the farm land, forest land, and many lakes of these two Midwestern states. The national scenic river is a primary geographic feature of the region. Adjacent to its length are several state parks, state forests, and state wild-life areas. These public lands and the access they provide are a popular recreational resource for the people of Minnesota and Wisconsin. (See “Regional Recreational Activities and Facilities” section.)

The eight-county region is in contrast to the nearby urbanized and industrialized Minneapolis-St. Paul area. This juxtaposition of rural-urban, open space-developed land, and leisure attraction-work place provides a large part of the area’s recreational appeal and sets the stage for large numbers of visitors to become temporary outdoor recreation users of the area. The recreational resources of these counties serve as the basis of a local tourism industry. As with most tourism components of an economy, tourism here is highly seasonal in nature and very much dependent upon the weather, even in the summer season.

Using the Money Generation Model, the NPS Public Use Statistics Program Center estimated that during 1996 more than \$22.6 million in total sales (both direct and indirect effects) were attributable to the entire riverway. Based on the percentage of visitation at the upper riverway, this means that about \$2.9 million of this total would have been generated in the upper riverway.

VISITOR SERVICES

All necessary services, such as food, lodging, gasoline, and automobile repairs, etc., are found within the region surrounding the riverway. However, availability depends upon location, with the highest concentration and greatest variety of services being found in the Minneapolis–St. Paul metropolitan area. Along the river, services are concentrated in the nearby small towns. The quantity and quality of services depends on the population of the town and surrounding service area.

POPULATION

Populations of the states of Minnesota and Wisconsin, the eight-county region surrounding the St. Croix National Scenic Riverway, as well as the Minneapolis–St. Paul Metropolitan Statistical Area and entire country are presented in table 14. Except for Douglas County, the years 1980 to 1992 have been ones of population growth for the geopolitical areas listed in table 14. Even Douglas County’s decline in population growth between 1980 and 1990 reversed itself in the early 1990s.

The eight-county region is sparsely populated relative to the nearby 11-county Minneapolis–St. Paul metropolitan statistical area (MSA). Population growth in the eight counties has varied greatly. Chisago County grew by nearly 36.7% while Douglas County experienced a slight decline. All but Chisago and Sawyer Counties experienced growth rates that were less than the national average. This fact reflects the less than national average growth rates for both Minnesota and Wisconsin.

In addition to the populations shown on table 14, the Duluth, Minnesota, area has about 200,000 people within about an hour’s drive of the upper Namekagon River.

**TABLE 14: ST. CROIX NATIONAL SCENIC RIVERWAY
POPULATION DATA AND PERCENTAGE CHANGE FOR SELECTED YEARS**

POPULATION (in thousands)							Total Percentage Population Change 1980 – 1994
State/County	1980	1990	1991	1992	1993	1994	
Minnesota	4,085.0	4,387.1	4,429.3	4,474.0	4,524.4	4,567.3	11.8%
Chisago	25.9	30.7	31.5	32.5	33.9	35.4	36.7%
Pine	20.0	21.3	21.5	21.9	22.4	22.8	14.0%
Wisconsin	4,713.6	4,902.3	4,949.1	4,996.9	5,044.1	5,081.7	7.8%
Bayfield	13.9	14.0	14.1	14.2	14.5	14.7	5.8%
Burnett	12.4	13.1	13.1	13.2	13.6	13.8	11.3%
Douglas	44.5	41.8	42.2	42.6	43.0	42.9	-3.6%
Polk	32.5	34.9	35.3	35.6	36.2	36.7	12.9%
Sawyer	12.9	14.2	14.5	14.9	15.0	15.3	18.6%
Washburn	13.2	13.8	13.9	14.1	14.5	14.8	12.1%
MSA^a	2,205.5	2,548.2	2,581.8	2,616.8	2,654.5	2,688.4	21.9%
United States	227,255.0	249,402.3	252,131.2	255,027.5	257,783.0	260,341.0	14.6%

SOURCE: Regional Economic Information System, Bureau of Economic Analysis, Economics and Statistics Administration, U.S. Department of Commerce, 1994 data.

a. Minneapolis–St. Paul Metropolitan Statistical Area consists of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Washington, and Wright Counties in Minnesota, and St. Croix County in Wisconsin.

ECONOMY

Five of the eight counties have services, and state and local government as their top two industries in terms of earnings (table 15). These two economic sectors are important in all eight counties. Manufacturing and retail trade are also important within the region.

Compared to the Minneapolis–St. Paul Metropolitan Statistical Area, the eight-county region has a relatively small economy as measured by earnings. This is to be expected given the relative population difference between the two areas.

TABLE 15: ST. CROIX NATIONAL SCENIC RIVER TOP THREE INDUSTRIES IN 1994 IN TERMS OF EARNINGS

Primary Economic Sectors in Terms of Earnings in 1994				
State/County	Industry and Percent of Total Earnings	Industry and Percent of Total Earnings	Industry and Percent of Total Earnings	Total Earnings (Thousands of \$)
Minnesota	Services (24.8%)	Durable Goods Manufacturing (12.8%)	State and Local Government (11.7%)	\$77,828,139
Chisago	Services (24.0%)	State and Local Government (14.8%)	Retail Trade (13.0%)	\$279,181
Pine	Services (27.9%)	State and Local Government (22.2%)	Retail Trade (13.1%)	\$176,821
Wisconsin	Services (22.1%)	Durable Goods Manufacturing (17.7%)	State and Local Government (12.3%)	\$76,322,787
Bayfield	Services (27.2%)	State and Local Government (20.1%)	Retail Trade (14.1%)	\$93,537
Burnett	Services (34.0%)	Durable Goods Manufacturing (18.1%)	State and Local Government (12.1%)	\$122,285
Douglas	Transportation and public Utilities (18.7%)	State and Local Government (18.6%)	Services (16.2%)	\$446,225
Polk	Services (19.5%)	State and Local Government (15.2%)	Durable Goods Manufacturing (14.7%)	\$312,153
Sawyer	Services (26.5%)	Retail Trade (14.6%)	State and Local Government (14.2%)	\$140,069
Washburn	State and Local Government (20.7%)	Services (19.3%)	Durable Goods Manufacturing (15.2%)	\$123,846
MSA*	Services (25.6%)	Durable Goods Manufacturing (13.1%)	State and Local Government (10.3%)	\$54,833,028

SOURCE: Regional Economic Information System, Bureau of Economic Analysis, Economics and Statistics Administration, U.S. Department of Commerce, 1994 data

* Minneapolis–St. Paul Metropolitan Statistical Area consists of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Washington, and Wright Counties in Minnesota, and St. Croix County in Wisconsin.

Average county per-capita incomes for the eight counties were consistently under the respective state average per-capita incomes (table 16). Minnesota's average per-capita income was comparable to the national average while Wisconsin's was about 5% below the national average.

The states of Minnesota and Wisconsin both had unemployment rates and poverty rates that were

below national averages (table 17). However, all eight counties had unemployment rates that were higher than the state and national averages. Chisago County was the only county to have a poverty rate that was less than the state average. Thus not only is the eight-state regional economy much smaller than the nearby Minneapolis–St. Paul regional economy, it is also less robust, which is revealed by higher unemployment and poverty problems.

TABLE 16: ST. CROIX NATIONAL SCENIC RIVER PER CAPITA INCOME FOR SELECTED YEARS

Per Capita Income Data for Selected Years (Thousands)						
State/County	1980	1990	1991	1992	1993	1994
Minnesota	\$9,982	\$18,779	\$19,271	\$20,454	\$20,911	\$22,217
Chisago	\$8,957	\$15,273	\$15,698	\$16,393	\$16,837	\$17,629
Pine	\$6,449	\$11,801	\$12,423	\$13,476	\$14,100	\$14,805
Wisconsin	\$9,772	\$17,398	\$17,962	\$19,115	\$19,855	\$20,884
Bayfield	\$7,150	\$13,069	\$13,560	\$14,095	\$15,074	\$15,692
Burnett	\$7,146	\$11,725	\$12,342	\$13,155	\$13,566	\$14,898
Douglas	\$8,573	\$14,165	\$14,695	\$15,481	\$15,960	\$16,782
Polk	\$8,230	\$13,944	\$14,283	\$15,345	\$16,134	\$17,040
Sawyer	\$7,212	\$12,165	\$12,812	\$13,524	\$14,441	\$15,386
Washburn	\$7,480	\$12,523	\$13,264	\$13,982	\$14,767	\$15,517
MSA^a	\$11,469	\$21,418	\$21,976	\$23,296	\$24,061	\$25,231
United States	\$9,940	\$18,666	\$19,201	\$20,147	\$20,812	\$21,696

SOURCE: Regional Economic Information System, Bureau of Economic Analysis, Economics and Statistics Administration, U.S. Department of Commerce, 1994 data.

a. The Minneapolis–St. Paul Metropolitan Statistical Area consists of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Washington, and Wright Counties in Minnesota, and St. Croix County in Wisconsin.

TABLE 17: ST. CROIX NATIONAL SCENIC RIVER UNEMPLOYMENT AND POVERTY (1990 CENSUS)

State/County	Percentage of Labor Force Unemployed	Percentage of Population Below the Poverty Level
Minnesota	5.1%	10.2%
Chisago	7.0%	7.8%
Pine	10.0%	15.0%
Wisconsin	5.2%	10.7%
Bayfield	9.0%	16.6%
Burnett	8.5%	15.5%
Douglas	9.5%	14.9%
Polk	6.7%	11.8%
Sawyer	11.7%	20.5%
Washburn	8.4%	15.9%
MSA*	4.6%	8.1%
United States	6.4%	13.1%

SOURCE: Census of Population and Housing, 1990: Summary Tape File 3 on CD-ROM (Minnesota and Wisconsin) [machine-readable data files] / prepared by the Bureau of the Census. -- Washington: The Bureau [producer and distributor], 1992.

* The Minneapolis–St. Paul Metropolitan Statistical Area consists of Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Washington, and Wright Counties in Minnesota, and St. Croix County in Wisconsin.

TRANSPORTATION/ACCESS

The St. Croix National Scenic Riverway is accessible by a well-developed federal, state, and local highway and road system. Interstates 35 and 94 bring travelers from the north and south and east and west, respectively, to the Minneapolis–St. Paul region. U.S. 8, Wisconsin routes 48, 70, and 77, and Minnesota Route 95 are the other primary east-west routes through the St. Croix River region. U.S. Routes 53 and 63, Minnesota Routes 23 and 65, and Wisconsin Routes 27 and 35 provide north-south access to the area. Numerous local roads, throughout the watershed, provide immediate access to the St. Croix and Namekagon Rivers for recreational users.

Most of the upper riverway is within two to four hours drive time of the Minneapolis–St. Paul metropolitan area. Modern highways, flexible work schedules and three-day weekends, higher incomes, and an increased desire to get away from it all have combined to place the St. Croix National Scenic Riverway within easy reach of more than 2.5 million people.

Also, air travel is possible to the Minneapolis–St. Paul International Airport from all parts of the globe. Local air service is available to Duluth and Brainerd, Minnesota, and Ashland and Eau Claire, Wisconsin, further increasing the recreational possibilities for persons outside the immediate region.



ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The potential key effects of the three management alternatives on natural scenic resources, natural and cultural resources, the visitor experience, and the socioeconomic environment of the riverway are examined in this section. These effects provide a basis for comparing the advantages and disadvantages of the alternatives.

Because of the conceptual nature of the alternatives, their potential consequences can be addressed only in general terms. The conclusions presented here are based on the National Park Service's review of existing information, information provided by other agencies, and the insights of NPS and Minnesota and Wisconsin Departments of Natural Resources staff who are familiar with the riverway. If and when specific NPS developments or other actions are proposed as a result of this *General Management Plan*, NPS staff will determine whether or not more detailed environmental documents need to be

prepared, consistent with provisions of the National Environmental Policy Act.

It is important to note that this analysis only applies to NPS actions within the upper riverway. Many other governmental agencies, organizations, and individuals own land within the upper riverway boundary and take actions that affect the riverway's resources and visitors.

Developments and actions are also being taken in the watershed, outside of the riverway, which affect the rivers. The National Park Service has no control over these actions, although it will work with the groups to minimize any adverse impacts on the upper riverway. Consequently, this environmental assessment does not assess the impacts of other organization's actions in or outside of the riverway, except briefly under the "Cumulative Effects" section.

IMPACTS ON NATURAL SCENIC RESOURCES

ALTERNATIVE 1

The natural scenic resources within the riverway boundary would be very much like they currently are (1997), with only subtle changes allowed to occur. The current predominant visual character is the northwoods ecosystem, which is occasionally interrupted by a town, cottage, camping area, bridge, swimming beach, or access point.

Proactive management — establishing objectives, standards, and measures of for the amount of naturalness and development and monitoring to make sure that uses stay within and meet those standards — in each of the management areas would help ensure the future preservation of the riverway's natural scenic resources. This management guidance would also provide the basis for discussions with entities outside the boundaries related to preservation of the natural scenic resources. Situations where this management guidance would prove valuable could include the rationale and justification for the enforcement of scenic easements, the foundation for objection to or support of certain types of surrounding land use practices, and the justification for certain scenic guidelines or preservation measures.

Managing the Hayward to Trego reach to meet the near-primitive area characteristics would preserve the area's remaining natural scenery. A positive impact of implementing this alternative (in keeping with the intent of the Wild and Scenic Rivers Act) would be that the rural character and naturalness of the Trego Flowage and Danbury would be preserved. Therefore, the overall visual quality within the riverway boundary would remain virtually unchanged.

When compared with alternative 2 and the no-action alternative, a visitor would have the least interruption of the natural environment and would see the least amount of development under this alternative. Resource impacts from

visitor use would also be the least under this alternative.

ALTERNATIVE 2

The visual quality could eventually be slightly degraded from current (1997) conditions under this alternative. If use increases there would be slightly more development allowed (relative to alternative 1) from Hayward to Trego and from Riverside to river mile 55. This increased development might include more campsites and an increase in the number and size of access points. Any new development would be designed to blend with the natural environment, and increased mitigation efforts would be undertaken to minimize the impacts of increased use on the shoreline and in camping areas. However, even the sensitively placed development would result in a slight reduction in the riverway's natural scenic resources. Areas near Trego and Danbury would be managed as urban instead of developed (as in alternative 1), and slightly more development could be allowed near these towns. Because of this difference in management area application, the communities of Trego and Danbury would not be encouraged to provide as much protection to the natural scenic and aesthetic qualities of areas under their jurisdictions, and some of the natural character of these areas could be lost.

Proactive management for the naturalness and development levels to be achieved in each of the management areas would help ensure the future preservation of the riverway's natural scenic resources. This management guidance would also provide the basis for discussions with entities outside the boundaries related to the preservation of natural scenic resources. Situations where this management guidance would prove valuable could include the rationale and justification for the enforcement of scenic easements, the foundation for objection to or support of certain types of surrounding land use

practices, and the justification for certain scenic guidelines or preservation measures.

When compared with alternative 1, development and resource impacts from visitor use would be more evident under this alternative, but in both cases it would be less than what would occur under alternative 3 (no action).

ALTERNATIVE 3

Because this alternative would not provide as many management tools (relative to alternatives 1 and 2) to protect the scenic resources of the riverway, there would be a higher potential for the degradation of scenic resources. Without well-outlined management objectives it would

continue to be difficult to guide the protection of the scenic resources and to inform partners what natural scenic qualities the National Park Service is trying to preserve.

The gradual increase in use under this alternative would impact scenic resources through the need to develop and provide more visitor facilities and services and through increased visitor-generated impacts on soil, vegetation, and other riverway resources. As per the *Master Plan*, the accommodation of increased use would be undertaken in a sensitive manner. However, managing the effects of these accommodations, as well as protecting the scenic resources themselves, would be easier under alternatives 1 and 2 because of the management framework provided.

IMPACTS ON NATURAL RESOURCES

AIR QUALITY

ALL ALTERNATIVES

Even with slight (alternative 1) or moderate (alternatives 2 and 3) increases expected in visitation, the pollutants from vehicles (coming into and leaving the riverway and state parks and forests) and motorboats and snowmobiles, there would be negligible changes in the region's air quality. Emissions from this relatively low number of vehicles would be dispersed throughout the 200-mile riverway. Local impacts also would not be expected to be significant.

NOISE

Under alternatives 1 and 2 the National Park Service would continue to educate visitors on this potential impact and rely on ranger patrols to try and promote the rivers' quiet ambience. With increased monitoring, ranger patrols, and efforts to educate visitors on this potential impact, serious noise impacts should not occur. However, under alternative 3 there would be fewer management tools and noise levels might increase throughout the riverway, particularly on summer weekends in the developed recreation and urban recreation management areas. With more groups coming to the rivers to recreate, sounds of people and their technology would be clearly audible in areas where visitors congregate (such as access points and campsites) for longer periods of time than they do now. Adjacent landowners probably would regularly hear noise from groups, particularly larger groups floating down the rivers. Overall, under alternative 3 noise would likely increase throughout the upper riverway, with the potential for significant temporary increases in localized areas.

ALL ALTERNATIVES

Even with slight (alternative 1) or moderate (alternatives 2 and 3) increases expected in visitation, much of the riverway would be relatively quiet most of the time. People would mostly hear ambient sounds, such as wind and rapids, as they do now. Generally, more noise would be apparent in the urban recreation and developed recreation management areas (especially on weekends) than in the near-primitive and northwoods recreation management areas. Visitors likely would continue to hear the sounds of people, vehicles, and equipment in the communities the rivers pass through, at bridge crossings, and along those portions of the riverway paralleled by roads; however, these sounds are outside of NPS control. Noise from occasional motorboats in the developed recreation management areas and more often in the flowages would continue. There would continue to be noise, mostly on weekends, in areas where people congregate, such as access points and campsites. Adjacent landowners would continue to occasionally hear noise from groups floating down the rivers.

During winter, noise from snowmobiles crossing the riverway would continue, mostly on weekends. This noise could be audible for long distances.

WATER RESOURCES

ALTERNATIVE 1

Under alternative 1, motorboat operation would continue to result in some discharges, leaks, and spills of petroleum products in localized areas. (Studies cited in Kuss et al. 1990 indicate that two-cycle motors may discharge as much as 30% to 46% of their fuels into the water. Another study estimated that the total discharge of hydrocarbons from one outboard engine

running all day equals the oxygen demand that is produced by the sewage of 400 people.)

Some visitors would continue to deposit food, trash, and human waste in the rivers. These wastes would continue to affect water quality, increasing nutrients and bacteria in short, intensively used stretches (such as between Danbury and Highway 77/48 and from Earl to Trego). Also, some sedimentation may be occurring at unsurfaced landings where visitors put in and take out their boats, in localized areas where visitors are eroding soils (e.g., erosion along trails to campsites and in areas where visitors are sliding down steep banks), and along stretches where inner tubes and canoes drag along the river bottoms. Because of the localized nature of many of these sources, the dispersion of visitors throughout the riverway, the rivers' dilution effects, and increased proactive visitor management (such as increased education efforts and patrols), pollution due to visitors would likely have a minimal effect on the upper riverway's overall water quality.

ALTERNATIVE 2

Under alternative 2, with the expected increased use on some stretches of the upper riverway, increases in water pollution would be expected in localized areas, as described for alternative 1. There would be an increased probability of more discharges, leaks, and spills of petroleum products in localized areas due to the operation of more motorboats under this alternative. There would also be an increased likelihood for the deposition of human waste in the rivers and for sedimentation at unsurfaced access points, in areas where visitors are sliding down steep riverbanks, and along stretches where visitors are dragging their watercraft along the river bottoms.

With careful monitoring, increased visitor education efforts, increased ranger patrols, and careful spatial and/or temporal regulation of where increases in visitor use occurs, these potential impacts could be kept to a relatively low level. The rivers' water volume also would

dilute pollutants from visitors. Thus, even with increased use, implementation of alternative 2 would be expected to have only a minor effect on the upper riverway's overall water quality.

ALTERNATIVE 3

Alternative 3 would have the highest potential of all the alternatives to result in increased water pollution because fewer management tools would be available to riverway staff (compared to alternatives 1 and 2). With increased use, increases in water pollution would be expected in much of the upper riverway. More discharges, leaks, and spills of petroleum products would likely occur in localized areas due to the operation of more motorboats. Human waste in the rivers would also likely increase, particularly in intensively used stretches such as between Danbury and Highway 77/48 and from Earl to Trego.

Sedimentation also would likely increase at various areas as described in alternative 2 (unsurfaced put-in/takeout points, localized areas where visitors are eroding soils, and possibly along stretches where inner tubes and canoes drag along the river bottoms). Despite a relative lack of management tools under this alternative, the pollution generated by visitors probably would still only have a minor effect on the upper riverway's overall water quality, largely because of the spatial and temporal dispersion of visitors throughout the riverway and the dilution of pollutants by the rivers.

FLOODPLAINS AND WETLANDS

ALTERNATIVE 1

No changes would be expected in the upper riverway's wetlands, and minimal changes would be expected on the floodplains under alternative 1, which would emphasize the maintenance of existing facilities. Where possible, any new development would avoid impacts on floodplains.

ALTERNATIVES 2 AND 3

New/improved recreational facilities (primarily campsites and access points) that might be developed under alternative 2 and the campsites and access points that might be moved or developed under alternative 3 would be located to avoid impacts on floodplains and wetlands — to previously disturbed areas where possible; none would be built on high-hazard floodplains. Consequently, under both alternatives 2 and 3 there would be a negligible effect on the extent and character of the upper riverway's overall floodplains and wetlands.

SOILS

ALL ALTERNATIVES

Most of the riverway's soils would not be affected by implementing actions proposed in any of the alternatives; minor soil disturbances would be expected in localized areas. During peak use periods it could be anticipated that at some developed areas, such as parking areas at access points, visitors might park their vehicles on unprotected or less prepared surfaces, resulting in soil erosion and compaction. Soil erosion would also continue to occur on steep trails to campsites and along high sand riverbanks that visitors slide down, particularly on the Namekagon from County Road K to the confluence with the St. Croix and from Hayward to Trego.

Although the National Park Service would continue efforts to prevent this soil erosion through visitor education, patrols, site restoration and hardening, and placement of signs and fences, some soil erosion would likely continue. Soil compaction and the formation of social trails could occur at existing campsites and access points. Eroded or bare soil in localized areas would continue to increase chances for the spread of exotic plants.

ALTERNATIVE 1

Implementing this alternative would have the least impacts on soils of any of the alternatives.

ALTERNATIVE 2

In alternative 2 there would be increased potential for soil erosion in localized, high-use areas because of increased numbers of visitors and because soils would also be disturbed or lost in areas where new recreational facilities were built or existing facilities were expanded. Overall, actions proposed in alternative 2 would likely result in minor impacts on soils in localized areas; however, the vast majority of the riverway's soils would not be affected under this alternative.

ALTERNATIVE 3

If the National Park Service expands some existing parking areas and campsites or builds new facilities in response to increased use, some soils would be disturbed or lost. Overall, there would be more potential for adverse impacts on soils in localized areas (compared to alternatives 1 and 2) because existing management tools and techniques would not be as comprehensive as those proposed in the other alternatives. However, despite having fewer management tools, little or no impact on most of the riverway's soils would be expected to take place.

VEGETATION

ALTERNATIVE 1

Impacts on vegetation would be largely localized and limited to existing developed areas, such as campsites and access points. The vegetation at many of these areas has already been affected by past use, and proactively managing visitor use would help minimize further impacts. However, during peak use periods some trampling of grasses, forbs, and other vegetation would continue at parking areas

and access points. Some visitors probably would continue to damage trees near campsites, stripping bark from birch trees, cutting saplings, and pulling down branches for firewood. Dead and down trees would likely become more scarce near campsites. Some areas affected by visitors would expand in size.

Some impacts would also continue to occur in areas where visitors camp at unofficial sites, particularly on the St. Croix River islands from the rapids near St. Croix State Park to County O highway. On these islands vegetation is being trampled and cut down. The National Park Service would try to minimize these impacts by visitor education, ranger patrols, and restoration projects.

Several other visitor activities probably would affect the riverway's vegetation in a few localized areas. In some areas equestrian use would trample vegetation and would likely increase the chances for the spread of exotic plants along the riverway. Disturbance of soils by visitors also would increase the likelihood of exotic plants like spotted knapweed and purple loosestrife becoming established. A few snowmobiles might leave marked trails, damaging younger trees and shrubs.

The resource management actions taken by the National Park Service would positively affect the riverway's vegetation, particularly in sensitive sites like riparian areas and wetlands. Such actions as preventing the spread of exotic plants, replanting damaged campsites, and reinstituting fire would increase plant species' natural diversity and abundance, maintain and restore native plant communities, and generally help restore natural succession in the riverway's plant communities. Increased cooperation and coordination with the town of Trego and the St. Croix Chippewa Indians of Wisconsin also would make it more likely that natural vegetation around the Trego Flowage and Danbury area would be protected under the management area recommended in this alternative.

However, it is assumed in alternative 1 (and 2) that the National Park Service, working in

association with the states, would be proactive in protecting the riverway's natural vegetation. By taking prompt action to prevent the spread of exotic plants, closing and replanting damaged campsites and access points, educating visitors to minimize their impacts, closely monitoring changes in vegetation, increasing ranger patrols, and carefully controlling what types of use occur and where increases in use occur, many of the above potential impacts could be mitigated and kept to a low level.

ALTERNATIVES 2 AND 3

The above description of impacts for alternative 1 also describes the impacts of implementing alternatives 2 and 3; however, the impacts would be slightly greater under alternative 2 and greater still under alternative 3 because of the increased visitor numbers expected in both alternatives and because of the new facilities that might be developed under alternative 2 and the improved or relocated facilities that might be developed under alternative 3. Also, under alternative 3 there would be fewer management tools to allow riverway staff to anticipate or quickly respond to impacts on vegetation.

There are a few other differences in impacts between alternative 1 and alternatives 2 and 3 because of the differences in development proposed. For example, with increased use on parts of the riverway there would be a higher potential for impacts on the upper riverway's vegetation, primarily at developed areas such as campsites and access points under alternatives 2 and 3. Increased motorboat use in shallow waters might uproot submerged vegetation and help disseminate nuisance aquatic macrophytes (Kuss et al. 1990) under alternative 2. Also, under alternatives 2 and 3 some vegetation would be disturbed or removed if new recreational facilities (such as access points and campsites) were developed or if existing facilities were expanded.

Under alternative 3, with increased use of the upper riverway, there would be a higher potential for impacts on vegetation, mostly in

and surrounding developed areas (such as campsites and access points).

CONCLUSION

Most of the riverway's vegetation would not be affected by visitors or NPS actions under alternatives 1 and 2. Some minor impacts on vegetation could occur under alternative 3 because riverway staff would have fewer management tools. NPS resource management actions would positively affect vegetation in localized areas, and adverse impacts caused by visitors would also likely be localized. Overall, there would be a minimal adverse impact on the riverway's vegetation under alternative 1 and, because of the expected increase in visitation, a minor adverse impact on the riverway's vegetation under alternatives 2 and 3.

WILDLIFE

ALTERNATIVE 1

There is potential for a few adverse impacts on wildlife from visitors in localized areas. Some individual animals might be disturbed or temporarily displaced by the sounds of slightly more motorboats, snowmobiles, and groups floating down the rivers. The extent and magnitude of this temporary displacement is not known, but it would not be expected to adversely affect the riverway's wildlife populations.

Animals such as chipmunks, mice, blue jays, raccoons, bears, and red squirrels likely would continue to be attracted to visitors and their food in localized areas, such as campsites. Concentrations of these species would likely increase on a seasonal basis.

The continuation of hunting and fishing would not be expected to adversely affect the riverway's populations assuming that harvests stay at about existing levels and there was careful monitoring and enforcement of the states' regulations. Some incidental hooking or snagging of sturgeon by visitors could continue to occur as

visitors floated down the rivers, even though fishing for this species is prohibited. Any fish removed from this small population could have a major impact, but how often this occurs now or might occur in the future is unknown. The National Park Service would continue to work with the states to educate visitors to minimize the potential for this impact.

Inner tubers and canoeists might continue to be adversely affecting benthic (riverbottom) populations, particularly freshwater mussels, as they drag their watercraft or walk over shallow areas.

Wildlife habitat quality and quantity would be improved in limited areas because of NPS efforts to increase natural plant diversity and restore plant communities by revegetating disturbed campsites and by controlling exotic plant species. Some actions, such as reinstituting fire, might temporarily adversely affect wildlife populations in localized areas, but other populations would likely benefit from these actions.

In alternative 1 (and 2) the National Park Service, working in association with the states, would take more actions (than currently) to manage visitor use. With increased education efforts and research and monitoring of wildlife and their habitats, more ranger patrols, and careful regulation of the types, levels, and timing of use on different parts of the upper riverway, it is believed that many potential visitor impacts could be kept to a low level.

ALTERNATIVES 2 AND 3

The above description of impacts for alternative 1 also describes the impacts of implementing alternatives 2 and 3; however, under those two alternatives the impacts would be slightly greater under alternative 2 and greater still under alternative 3 because of the increased visitor numbers expected in both alternatives and because of facilities that might be developed under alternative 2 and the improved or relocated facilities that might be developed under alternative 3. Also, under alternative 3

there would be fewer management tools to allow riverway staff to anticipate or quickly respond to impacts on wildlife.

If recreational developments were built or expanded (alternative 2) or improved or expanded (alternative 3), a small amount of wildlife habitat would be altered or lost in localized areas. Some animals also would probably be temporarily displaced during the construction or relocation of the facilities.

Larger numbers of inner tubers (allowed under alternatives 2 and 3) could increase siltation in these areas or scour the bottom, potentially affecting mussels and other benthic organisms. The extent of this impact now and in the future is not known, but impacts would likely be localized.

Although most riverway wildlife has already adapted to people in the riverway, increased visitor use levels in alternatives 2 and 3 would have the potential to result in adverse impacts on wildlife in localized areas because of the increase in visitor numbers and use and because of the potential development proposed. Also, in alternatives 2 and 3 the number of people fishing would probably increase. Assuming that interest in hunting in the riverway and state hunting regulations did not notably change, hunting probably would stay at about existing levels. Neither fishing nor hunting harvests would be expected to adversely affect the riverway's populations assuming there was careful monitoring and enforcement of the states' regulations.

Also, in alternatives 2 and 3 the propeller action of more motorboats might disturb the riverway's aquatic fauna, particularly during sensitive periods (e.g., fish spawning, mussel feeding, and larval release periods). With no data, it is not possible to estimate the extent of these impacts, but they would likely be localized. Increased motorboat use also would increase the potential for the introduction of zebra mussels. If this aggressive colonizing species becomes established in the upper riverway, it could cause

native species displacements and nuisance impacts.

CONCLUSION

Most NPS actions in alternatives 1, 2, and 3 would continue to promote the protection of wildlife populations and habitats. Under all alternatives no actions would be taken that would affect areas known to be of special importance for breeding, nesting, foraging, or wintering, nor would actions be taken that could interfere with migration along the riverway. Most of the upper riverway's wildlife populations and habitats would not be affected by NPS and visitor actions under alternative 1 and would be only minimally impacted under alternatives 2 and 3. Proactively managing visitation should help reduce the potential for new impacts under alternatives 1 and 2. It is expected that alternative 3 would have a minimal impact on most of the upper riverway's wildlife populations because riverway staff would have fewer management tools.

THREATENED AND ENDANGERED SPECIES

ALL ALTERNATIVES

Federal and state-listed threatened and endangered species and federal candidate species would not be adversely affected by implementation of any of the alternatives. No actions by visitors are known to be adversely affecting federally listed species and their habitats in the upper riverway. (Indeed, the wolf population is believed to be increasing in the upper riverway area, and the bald eagle population is stable or increasing.)

Generally, maintaining uses at existing levels and developed areas (alternative 1) would help ensure that additional impacts on these species did not occur. With increased numbers of visitors and use levels (alternatives 2 and 3), there would be the potential to affect some species that are sensitive to human disturbance

or areas that provide habitat for listed species. However, such impacts would not be anticipated.

Although new recreational facilities might be built under alternative 2, or improved or relocated under alternative 3, it is not expected that construction or use of these facilities would affect threatened or endangered species or their habitats. All facilities would be located to avoid

threatened and endangered species habitats, and the sites also would be inventoried before construction to ensure that impacts were avoided.

Any new visitor impacts on such species would be promptly addressed through regulation of visitors, in consultation with the U.S. Fish and Wildlife Service and the state departments of natural resources.

IMPACTS ON CULTURAL RESOURCES

ALL ALTERNATIVES

Historic structures could be better protected if adaptive reuses or preservation partnerships could be developed. Because the cultural landscape inventory for the riverway has just been initiated, no management direction can currently be set for any cultural or historic landscapes that might exist in the riverway. This plan recommends that the riverway continue management efforts on the natural resource qualities for which the riverway was created. However, as additional data on cultural landscapes emerges, NPS managers would have the flexibility to incorporate specific landscape settings in its resource protection and management efforts.

ALTERNATIVE 1

The riverway's archeological resources would have slightly more protection than they have under current conditions because this alternative would preserve the greatest percentages of riverway in near-primitive conditions. The low-impact visitor activities consistent with this management area would pose little risk for archeological resources. Also, this alternative proposes no new construction that could potentially adversely affect belowground resources.

Although this alternative is weighted toward resource preservation, the riverway's primary emphasis would be on natural resources. As a result, management could pose some minor adverse impacts on cultural resources. For example, in some portions of the near-primitive northwoods management areas, historic structures might be removed to enhance those qualities that led to the management area's classification. The same could apply to structures in the northwoods recreation management areas if their removal contributed to the qualities of seclusion, quiet, and naturalness for which the riverway

was created. Similarly, removing historic structures or other development might result in adverse impacts on cultural landscapes that have yet to be identified. A broad range of alternatives from preservation to removal would be considered for historic structures, regardless of the management area in which they are located.

ALTERNATIVE 2

Archeological resources could be at a slightly higher risk because of increased visitation. Archeological resources adjacent to campsites could be subject to additional pressures from increased visitation; archeological resources at remote campsites would continue to be difficult to protect.

Cabins and other structures determined eligible for the national register might have more protection under this alternative because a significantly smaller proportion of the riverway would be designated as near-primitive northwoods and there would be fewer structures needing to be removed as intrusions in those areas. In northwoods recreation management areas, national register-eligible properties would potentially enhance the qualities that led to the designation of that management area; however, safety concerns might still require the removal of some structures. Also, without maintenance, historic structures could become targets for vandalism and for use by the homeless. The development of preservation partnerships and adaptive reuse strategies, where appropriate, would provide a higher level of protection for historic structures.

Depending upon the final conclusions of the riverway's cultural landscape inventory, the relatively higher percentage of land managed for northwoods recreation and urban recreation under alternative 2 could allow for relatively few alterations of the riverway's historic or cultural landscapes. The completion of the cultural landscape inventory would allow riverway staff

to plan appropriate protective measures for any significant cultural landscapes.

ALTERNATIVE 3

Archeological resources would be at a slightly higher risk because of increased visitation and the improvement and relocation of facilities.

National register-eligible structures and contributing features might also face increased impacts from escalating levels of use. Funding for the maintenance of these structures in all probability would be limited, raising the potential that they would deteriorate and attract

vandals or be used by homeless people and would need to be removed.

The 1976 *Master Plan* predates any substantive work on cultural landscapes and therefore makes few provisions for their protection. It could be assumed that the increased level of development in the riverway allowed under the 1976 *Master Plan* would increase the potential of impacts on any significant cultural landscapes through construction or other development. This alternative would also provide opportunities for the retention of structures, similar to alternative 2.

IMPACTS ON THE VISITOR EXPERIENCE

ALTERNATIVE 1

Over the long term, opportunities for quiet and solitude would be better protected. If use pressure began to increase or uses changed to the point where unacceptable impacts began, increased direct and/or indirect regulation of visitors and behaviors would be certain, and visitor access and use of the riverway would be more restricted than it currently is. Restrictions on numbers and types of uses in specific areas to prevent resource damage might mean that some visitors could not visit their desired location on the riverway at the time and date they might wish.

Proactive management, monitoring, and restricting use on specific reaches, when necessary, would help preserve the natural resources and ensure opportunities for high-quality visitor experiences. Conflicts between users would likely be resolved through proactive management, such as setting and enforcing capacity limits in certain areas or using a reservation system, which could improve some visitors' experiences.

ALTERNATIVE 2

Visitors would continue to enjoy a full range of opportunities; however, the existing visitor experience would be allowed to change on some segments of the riverway, and overall visitor use of the riverway could increase. The probability of encountering other visitors and recreational developments could also increase. With expanded (new or improved) facilities and programs, more visitors could enjoy the area's diverse resources. Opportunities would be increased for educational programs and interpretation of natural and cultural features because more staff would be available to the public. Visitors would find fewer primitive facilities on some reaches of the riverway, but

more improved developed facilities overall. Additional motorboat use would be allowed.

Opportunities for solitude, quiet, and adventure would probably decrease from current levels, and people might have to travel to more remote areas to find such experiences as more intense and mechanized recreational uses take place. However, people seeking highly interactive "social" experiences (for example large groups of canoeists and inner tubers) would have opportunities for those experiences. Careful site selection for new access points and parking could disperse use to preserve as much feeling of solitude as possible while offering opportunities for varied experiences. Also, the probability of encountering more motorized boats, many of which could be traveling at faster speeds, would be higher than it is now.

There would be greater potential for resource impacts that detract from visitor experiences as more visitors come to the riverway; however, increased monitoring, possible restrictions in uses in specific areas when necessary, and proactive resource protection would mitigate these impacts and ensure opportunities for high-quality visitor experiences. Restrictions would also be expected to positively influence visitor behavior and better protect riverway resources. However, because the tolerance for increased numbers of visitors allowed in specific areas of the riverway at one time would be greater under this alternative, restrictions would come at a later time than under alternative 1.

Conflicts between users, which would be more likely under this alternative, would also likely be resolved through proactive management, which would improve visitors' experiences.

Area residents might object to increased traffic on roads and waterways. Overall the riverway might seem more congested, more developed, and more easily accessible, and more people would be able to enjoy high-quality experiences;

however, visitors would still not have unrestricted access to riverway resources.

ALTERNATIVE 3

This alternative is based on the 1976 *Master Plan* and would be less restrictive on visitor use opportunities than the other alternatives (1 and 2). The range of visitor experiences now provided could expand or change with increased visitation. The use of motorboats would probably also increase. Some visitors might benefit from increased opportunities for group experiences on the water; however, other visitors seeking quiet and solitude would probably be inconvenienced and might choose to recreate in other places.

The National Park Service would have fewer management tools and it could often be more difficult to anticipate and quickly respond to visitor use and resource management concerns. This situation would also make it difficult to inform partners about what visitor experience qualities and resource conditions the National Park Service was trying to preserve.

In some instances unmet visitor expectations could lead to visitor conflicts. Access might become a problem if visitors sought a route to the water with few if any additional access facilities. Roadside parking and social trails could adversely affect the scenic quality, which is a major visitor attraction. Continued deterioration of facilities and degradation of resource qualities would accelerate impacts on visitor experiences. Safety monitoring would become a greater problem for protection rangers. There could be more impacts on natural and cultural resources over time under this alternative, which could eventually affect the visitor experience. For example, canoe landings might erode because of increased human presence and the loss of vegetative cover; this could affect the site's capability to serve as a safe and attractive put-in and takeout site.

As the amounts of use and types of use increase and if riverway funding and staffing remain essentially the same, some riverway concerns would not be addressed quickly, and the increasing workload could become a burden on the riverway's staff and resources. More staff might be required to ensure visitor safety for the larger (than the other alternatives) numbers of visitors, and the level of service provided to visitors could decrease over a period of years.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

ALTERNATIVE 1

Some short-term positive economic benefits in the form of increased jobs and development expenditures for minor, small-scale construction- and development-related activities would occur. Long-term gains in employment and NPS expenditures would also accrue to the local economy due to the addition of 12 permanent and 16 seasonal positions at an annual cost of about \$1,260,118 (1996 dollars). This figure includes salaries and benefits and operational support funds.

Short- and long-term economic and social benefits would occur over time. Development projects and increased staffing would probably be accomplished in phases. Therefore not all benefits would occur at the same time.

There would be marginal changes in the economic and social benefits to the regional economy; individual enterprises or individuals could be positively or negatively affected, e.g., motels, restaurants, canoe rentals, snowmobile rentals, hunters, and bait shops. The overall economic effects on the regional economy would not be significant due to the size of the eight-county regional economy.

ALTERNATIVE 2

Some short-term positive economic benefits in the form of increased jobs and development expenditures for construction- and development-related activities would occur.

Long-term gains in employment and NPS expenditures would also accrue to the local

economy due to the addition of 11 permanent and 18.5 seasonal positions and the upgrading of several other positions at an annual cost of about \$1,265,784 (1996 dollars). This figure includes salaries and benefits and operational support funds.

Short- and long-term economic and social benefits would occur over time. Development projects and increased staffing would probably be accomplished in phases. Implementation of visitor controls would also probably be phased in only as necessary. Therefore not all impacts would occur at the same time. Thus, time would be a mitigating factor.

Implementing alternative 2 would bring marginal changes in the economic and social benefits to the regional economy; individual enterprises or individuals could be positively or negatively affected. The overall economic effects on the regional economy would not be significant due to the size of the eight-county regional economy.

ALTERNATIVE 3

There would essentially be no change in the regional short- or long-term economic conditions related to the riverway. Some individuals or enterprises might be positively or negatively affected. The overall economic effects on the regional economy would not be significant due to the size of the eight-county regional economy.

CUMULATIVE EFFECTS

Cumulative impacts are defined as

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

(40 CFR 1508.7)

To address cumulative impacts it is necessary to address what actions might occur in the riverway vicinity in the future. For purposes of analysis, this section considers 10 years to be a reasonable foreseeable time frame to examine the cumulative impacts of future actions.

Within the vicinity of the riverway there are actions and activities in the foreseeable future that could impact the vicinity's scenic, natural, and cultural resources, visitor experience, and the socioeconomic environment. However, the impacts from these actions or activities might not all result in significant cumulative impacts. And in most cases the proposed impacts from NPS actions would be expected to add negligible increments to these cumulative impacts.

Actions or activities in the vicinity of the riverway that could result in cumulative impacts would be primarily related to development. The Minneapolis/St. Paul metropolitan area has grown rapidly over the last two decades. Urban growth in Minnesota has spilled over into Wisconsin; St. Croix County is now Wisconsin's fastest-growing county. This rate of growth is expected to continue for the foreseeable future and will result in increased pressure on regional recreational resources and facilities. As a favored destination for Twin Cities residents, the St. Croix riverway will almost certainly be pressured because of additional users.

Continued population growth in the Minneapolis / St. Paul metropolitan area in all likelihood would trigger additional growth and development in the communities along the Upper St. Croix and Namekagon Rivers. Population increases in these communities will also bring additional user pressures to the riverway.

Provided there are no changes to local zoning, new development in much of the vicinity would occur at low densities. Current zoning in much of the vicinity is dispersed, with single homes on 5-acre lots or clustered development with multiple homes on 1 acre and the adjoining 39 acres left natural. If current trends continue, increased development would also occur at a slow to moderate pace. However, an increase in the current capacities of the vicinity's transportation and utilities infrastructure would significantly increase development pressures, particularly in Wisconsin.

Wisconsin has prepared a highway improvement plan, scheduled for completion in the year 2020. The plan proposes expansion of Highway 53 to a four-lane highway, which would require expanding the highway bridges on the St. Croix and the Namekagon. The 2020 program also proposes improvements to other highways serving central and northern Wisconsin. These improvements are intended in part to provide better access for tourists.

Specific development activities proposed near the riverway include the St. Croix Chippewa Indians of Wisconsin's proposal to build a fish hatchery near Danbury; the excavation of gravel pits on non-NPS lands; residential second home construction, and a recent proposal to develop a small golf course near the riverway. Also, lumber mills in the vicinity occasionally expand their facilities, and they also affect the amount of logging that occurs regionally.

NATURAL SCENIC RESOURCES

Currently, the area has a number of small communities surrounded by rural development, a few lumber mills, and some industry. There are many public tracts of land (state parks, wildlife management areas, state forests, and national forests), which will continue to have mostly natural vegetation. There are also several county forests that will continue tree farming practices and a lot of private property that is currently undeveloped.

The area's rural characteristics will gradually diminish as population pressures from the Twin Cities spread northward. However, it is expected that these changes will occur at a slow to moderate pace provided the area's zoning standards and transportation and utilities infrastructure do not change. Development changes will be most noticeable on undeveloped private tracts as infill occurs, in the town centers, and at the town's commercial/industrial edges, which will spread. The area's many public tracts are not expected to change visually, with the exception of logging on forest tracts. As development occurs, there would be a greater demand for gravel from the area's gravel pits and for more wood products from the area's forests (and possibly the expansion of lumber mills). A fish hatchery is proposed near Danbury, and a golf course is being proposed near the riverway.

The cumulative impact on the natural scenic resources of the vicinity by these activities would be largely a factor of the sensitivity of planning and design. Depending on the location and design of the proposed fish hatchery near Danbury or any expansion of the lumber mills, they would either have a negligible or significant impact on the area's natural scenic resources. The development of undeveloped tracts could either be starkly or imperceptibly visible from major thoroughfares. The expansion of commercial and industrial areas could either be a haphazard sprawl or a regional showcase.

Cumulative impacts on the scenic quality by NPS actions would vary slightly depending on the alternative. Alternative 1 would have no

cumulative effects on natural scenic resources in the vicinity because there would be few changes from the existing scenic quality. Alternative 2 would allow more development to occur; however, this development would blend with the natural environment. These impacts would have a negligible cumulative effect on the vicinity's natural scenic resources due to their sensitive development and minor scale relative to overall development in the entire region.

Both alternatives 1 and 2 would have proactive management for naturalness and the development levels for the riverway, which would help ensure the preservation of natural scenic resources. Alternative 3 could result in some cumulative impacts on the riverway's natural scenic resources because riverway staff would have fewer management tools to protect resources. These impacts would contribute to the change of the natural scenic resources of the vicinity; however, they would be expected to add only negligible increments to scenic cumulative impacts in the region.

NATURAL RESOURCES

For many years people have been using and changing the resources of the upper riverway. These activities have had a cumulative effect on the riverway, altering the riverway's water quality, flows, soils, vegetation, and wildlife in localized areas. However, human activities and developments outside and inside the upper riverway but outside of NPS control have more potential to result in cumulative effects on the riverway's resources in the future than does implementing the actions in any of the alternatives. Some of these cumulative impacts could be significant.

As the region's population continues to grow, new development (such as second homes) is likely to occur near the riverway and in the communities along the rivers. This development would likely impact the riverway's vegetation and wildlife populations (which do not stay just within the linear riverway). Habitat fragmentation in the landscape surrounding the riverway

will likely continue. Activities on non-NPS lands within the riverway boundary, such as logging of county lands, will also probably affect the riverway's natural communities.

The riverway's water quality is expected to be affected to a large degree by sources outside of the riverway. Runoff from construction projects, sand and gravel operations, agricultural activities, roads, and sewer and septic systems would probably add sediments, heavy metals, pesticides, nutrients, and other pollutants to tributaries that flow into the riverway, which in turn would likely have a cumulative effect on the riverway's natural communities. The hydro-electric dams on the upper riverway are also expected to continue to affect the riverway's in-stream flows, water quality, and aquatic and floodplain fauna and flora, including the migration of fish and mussels. Changes in water flows and water quality, habitat fragmentation, and the loss of habitat, occurring individually or together, would likely result in cumulative effects on the riverway's natural resources.

As described earlier, impacts from increased use and NPS actions in any of the alternatives would have the potential for negligible to minor impacts on the riverway's water resources, soils, vegetation, and wildlife. These impacts would contribute incrementally to impacts from the sources noted above. However, the magnitude of the impacts in the alternatives would not be expected to result in an appreciable cumulative effect on the upper riverway's natural resources. With a proactive management approach, cumulative impacts resulting from NPS actions would be less likely in alternatives 1 and 2 than in the no-action alternative (3), which would have fewer management tools.

CULTURAL RESOURCES

A number of factors could impact cultural resources in the St. Croix riverway. These include additional urban and suburban growth, increased tourist and recreational pressures, logging, and transportation improvements. These additional users could impact historic and

archeological resources, as well as significant cultural landscapes.

Bridge construction could potentially pose adverse impacts for archeological resources and significant cultural landscapes in those portions of the riverway.

Additional tourist activity in areas improved through Wisconsin's 2020 highway program potentially could lead to increased use of the St. Croix National Scenic Riverway, including the Namekagon River, which in turn could adversely affect cultural resources, including archeological resources.

It is anticipated that the proposed actions under each of the three alternatives would result in a negligible addition to the cumulative impacts from the conditions listed above. No appreciable cumulative impacts on the upper riverway's cultural resources would be expected from NPS actions. With a proactive management approach, cumulative impacts resulting from NPS actions would be less likely in alternatives 1 and 2 than in the no-action alternative (3), which would have fewer management tools.

VISITOR EXPERIENCE

Implementing the *Minnesota State Park System Five-year Interpretive Services Plan* (1995b) and Saint Croix National Scenic Riverway's interpretive prospectus (1995a) would significantly and positively impact future visitor experience opportunities. Both plans propose improvement in the quantity and quality of visitor services and facilities along the riverway. Coordination, communication, and cooperation among federal, state, and local agencies and private organizations involved in interpretation would enhance understanding of the Saint Croix River valley's significance and the need to preserve or improve existing resource and visitor use conditions. Continued development and proposed forest logging adjacent to or visible from the riverway could impose significant visual intrusions and water quality degradation

that would negatively impact visitor experience opportunities.

Negligible effects on the visitor experience would be expected from NPS actions in alternatives 1 or 2, and cumulative effects from other actions would be minimal. Alternative 3 would have the greatest potential cumulative impact. Gradual but continual increase in visitor use, both inside and outside the park, and increases in development and logging outside the park could result in moderate cumulative impacts in the most heavily impacted areas.

SOCIOECONOMIC ENVIRONMENT

The regional economy has earnings measured in the hundreds of millions of dollars and employs thousands of individuals. In addition, the eight-county region is likely to continue to grow, with increasing population, increasing economic development, and increasing numbers of jobs.

The pattern of advancing urban-suburban growth in the Minneapolis/St. Paul metropolitan area, the desirability of a rural lifestyle, and advances in technology that are widening the possibility of telecommuting, as well as creating new job opportunities, all point to economic and social growth within the region being a continuing part of the riverway's future.

Alternatives 1 and 2 would result in positive contributions to the economy and employment situation in the region, but only to a very minor extent. The relative small numbers of jobs and relative minor contribution of an increased annual budget for the park would not add significantly to the expected growth or the total economy of the region. Alternative 3 would have almost no additional impact on the region's social or economic growth. Thus, no appreciable socioeconomic cumulative impacts would result from the NPS alternative actions occurring in conjunction with the region's expected overall social and economic growth.

TABLE 18: SUMMARY OF IMPACTS

	ALTERNATIVE 1 (PREFERRED ALTERNATIVE)	ALTERNATIVE 2	ALTERNATIVE 3 (NO ACTION)
IMPACTS ON NATURAL SCENIC RESOURCES	Riverway would be very much as it is. Least interruption of natural environment and least development.	Development and resource impacts could be more evident.	Gradual increase in use could negatively impact natural scenic resources over the long term.
IMPACTS ON NATURAL RESOURCES			
Air Quality	Negligible effect	Same as alternative 1.	Same as alternative 1.
Noise	Minimal effect overall on the riverway; some noise would continue to be evident in localized areas.	Slightly increased noise levels in specific areas, particularly on weekends.	Increased noise throughout the riverway; potential for significant temporary increases in localized areas.
Water Resources	Minimal adverse effect overall on the riverway; potential for some pollution in localized areas.	Minor adverse effect on the rivers' overall water quality; increased pollution in localized areas.	Minor adverse effect on overall water quality; increased pollution possible throughout much of the riverway.
Floodplains and Wetlands	Minimal changes.	Same as alternative 1.	Same as alternative 1.
Soils	Minor disturbance in localized areas.	Increased potential for soil erosion in localized areas; most riverway soils would not be impacted.	Highest potential for increased soil erosion; potential for major impacts in localized areas, but little or no impact on most riverway soils.
Vegetation	Minimal overall impacts; minor adverse impacts in localized areas.	Higher potential for more impacts; most impacts would be minor and in localized areas.	Highest potential for impacts on vegetation; most impacts would be minor and in localized areas.
Wildlife	Negligible impacts on the riverway wildlife populations.	Minimal impacts on most riverway wildlife populations; minor impacts possible in localized areas.	Highest potential for impacts; minimal impacts on most riverway wildlife populations; minor impacts likely in localized areas.
Threatened and Endangered Species	Not likely to adversely affect threatened or endangered species on federal list.	Same as alternative 1.	Same as alternative 1.

	ALTERNATIVE 1 (PREFERRED ALTERNATIVE)	ALTERNATIVE 2	ALTERNATIVE 3 (NO ACTION)
IMPACTS ON THE CULTURAL RESOURCES	<p>Cultural resources might have slightly more protection than they have now.</p> <p>Some historic structures might be removed, the impacts of which would be mitigated by prior documentation.</p>	<p>Cultural resources might be slightly more at risk because of increased visitation.</p> <p>Register-eligible structures might have more protection because few would likely need to be removed. Some structures could become targets for vandals or for use by the homeless.</p>	<p>Cultural resources might be slightly more at risk because of increased visitation.</p> <p>Register-eligible structures might be impacted more because of increasing use levels; however, some might have more protection because few would likely need to be removed. Structures would more likely deteriorate and attract vandals and use by the homeless.</p>
IMPACTS ON THE VISITOR EXPERIENCE	<p>Visitors would continue to enjoy existing range of opportunities. Opportunities for solitude would be better protected, as would riverway resources.</p>	<p>Visitors would continue to enjoy full range of opportunities, but experiences would change somewhat on some riverway segments. More visitors could more easily enjoy the area's diverse resources. Opportunities for solitude would be less than current levels..</p>	<p>Less restrictions on visitor use opportunities than other alternatives. More opportunities would be available for large groups to enjoy the resources, and there would be less opportunity to find solitude and quiet. Level of service for visitors would probably decrease over the long term.</p>
IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT	<p>Marginal changes in the economic and social benefits to the regional economy would not be significant due to size of eight-county region.</p>	<p>Same as alternative 1.</p>	<p>Essentially no change in economic and social benefits to the regional economy.</p>

	ALTERNATIVE 1 (PREFERRED ALTERNATIVE)	ALTERNATIVE 2	ALTERNATIVE 3 (NO ACTION)
CUMULATIVE EFFECTS			
Natural Scenic Resources	No additional cumulative effects on natural scenic resources from NPS actions.	Negligible cumulative effect on natural scenic resources.	Negligible cumulative effect on natural scenic resources.
Natural Resources	No appreciable cumulative effects expected.	Same as alternative 1.	Same as alternative 1.
Cultural Resources	No appreciable cumulative effects expected.	Same as alternative 1.	Same as alternative 1.
Visitor Experience	NPS plans/actions combined with state plans/actions would positively impact future visitor experience opportunities. Continued development and proposed logging adjacent to or visible from the riverway could impose significant visual intrusions. Cumulative effects would be minimal.	Same as alternative 1.	NPS plans/actions combined with state plans/actions would positively impact future visitor experience opportunities. Continued development and proposed logging adjacent to or visible from the riverway could impose significant visual intrusions. This alternative would have greatest potential cumulative impacts because of continual increase in visitor use, both inside and outside the park, and development and logging outside the park. Moderate cumulative impacts on the visitor experience could occur in heaviest impacted areas.
Socioeconomic Environment	Proposed NPS actions would have no appreciable cumulative impacts on the region's expected overall social and economic growth.	Same as alternative 1.	Same as alternative 1.

COMPLIANCE

In implementing the general management plan for the Upper St. Croix National Scenic Riverway, the National Park Service would comply with all applicable federal state, and local regulations, statutes, laws, and executive orders, including the following.

NATURAL RESOURCE COMPLIANCE

WILD AND SCENIC RIVERS ACT (82 STAT. 906) AS AMENDED

As a designated wild and scenic riverway, the National Park Service will comply with all provisions of the Wild and Scenic Rivers Act. If any water resources projects are proposed within the Upper St. Croix National Scenic Riverway that might affect the upper riverway, the National Park Service is required to conduct an evaluation under section 7 of the act.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

This act sets forth the federal policy to preserve important historic, cultural, and natural aspects of our national heritage. It requires federal agencies to use a systematic, interdisciplinary approach that integrates natural and social sciences in planning and decision making that may impact the human environment.

The *General Management Plan / Environmental Assessment* was prepared pursuant to this act and its implementing regulations and guidelines. Implementation of this plan will require ongoing adherence to the National Environmental Policy Act. Additional NEPA documentation may need to be prepared in the future if NPS facilities are moved or altered or other actions are taken to manage visitor use.

ENDANGERED SPECIES ACT OF 1973, AS AMENDED (16 USC 1531 ET SEQ.)

Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. In compliance with the Endangered Species Act of 1973, as amended, the National Park Service initiated informal consultation with the U.S. Fish and Wildlife Service during the development of this plan (see appendix G).

Should the National Park Service propose future actions within the riverway, they will consult and coordinate with the U.S. Fish and Wildlife Service, tribal governments, and the states of Minnesota and Wisconsin to identify and analyze potential impacts on threatened and endangered species and develop mitigation measures. Before any new construction occurs in the riverway, during the design phase, further surveys and consultation would occur to protect listed species. Formal consultation with the U.S. Fish and Wildlife Service will be requested if it is determined that an NPS action is likely to adversely affect a threatened or endangered species.

EXECUTIVE ORDER 11988, "FLOODPLAIN MANAGEMENT"

This order requires all federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. It is not expected that any new developments would be built under the preferred alternative that would adversely affect the floodplain. However if new developments or relocations of existing developments are proposed, during the design stage of any proposed alteration or new development, the most recent floodplain maps would be consulted and structures would be sited to avoid

the 100-year floodplain if possible, unless the activity is exempted. NEPA documentation and a statement of findings would be prepared if adverse impacts on floodplains were expected due to NPS actions.

EXECUTIVE ORDER 11990, "PROTECTION OF WETLANDS"

This order requires federal agencies to avoid, where possible, impacts on wetlands. No known wetlands would be affected by implementing the preferred alternative. It is not expected that new developments would be built that would impact wetlands; however, if facilities are altered or moved, or new facilities are built, the most recent wetland maps would be consulted to ensure that facilities are sited outside of any wetlands to the extent possible. NEPA documentation and a statement of findings would be prepared if adverse impacts on wetlands were expected due to NPS actions.

CLEAN AIR ACT, AS AMENDED (42 USC 7401 ET SEQ.)

Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations. Riverway staff would work with the states of Minnesota and Wisconsin to ensure that all riverway activities meet all requirements. If NPS facilities are altered or built in the riverway, an analysis of anticipated emissions from construction activities would be conducted during the design phase to ensure conformity with federal and state air quality regulations as part of the Clean Air Act.

SECTION 404, CLEAN WATER ACT

In the unlikely event that the National Park Service would propose activities requiring dredging or depositing fill material to the waters of the United States (including wetlands and waterways), the National Park Service would

submit an application for a section 404 permit to the Army Corps of Engineers.

STORM WATER RULE (40 CFR, PARTS 122, 123, AND 124)

Although new facilities are not expected to be built under the preferred alternative, if the National Park Service builds or alters facilities in the upper riverway, they will comply with provisions of the Storm Water Rule. The Storm Water Rule requires that an Environmental Protection Agency (EPA) national pollution discharge elimination system (NPDES) notice of intent be submitted to the Environmental Protection Agency, with a copy sent to the appropriate state department of environmental quality, on construction activities in excess of 5 acres. This includes activities such as clearing and grading; such clearing and grading activities might affect stormwater discharge.

Additionally, the Environmental Protection Agency's NPDES process requires a storm water pollution prevention plan be developed before any ground-disturbing activities. This prevention plan is the guiding tool for preventing, minimizing, and mitigating soil erosion and water pollution during construction activities; the completed prevention plan must be available for public and agency inspection at the construction site.

RIVERS AND HARBORS ACT OF 1899 (33 USC 401–403)

This act established permit requirements for construction of bridges, causeways, dams, or dikes within or over navigable waters of the United States under section 10 of the act. Section 13 also requires an Army Corps of Engineers permit for the discharge of refuse of any kind (except liquid from sewers or urban runoff) from land or vessels into the navigable waters of the United States or into their tributaries.

SUSTAINABILITY OF RIVER- WAY OPERATIONS AND DEVELOPMENT

One of the goals in *The National Park Service Strategic Plan* (NPS 1994) is to achieve sustainability in all NPS operations and development. The *Strategic Plan* called for NPS activities and development to be sustainable parts of the ecosystem and cultural context, accomplished by working with natural processes and enhancing cultural values. The plan further states that it would be desirable for all facilities and infrastructure to be energy-efficient and well-maintained, that development be economically as well as ecologically sustainable, that on-site power generation be accomplished with renewable energy, and that parks use management practices that work with ecosystem processes, conserve water and energy, and avoid pollution.

On the Upper St. Croix National Scenic Riverway, the National Park Service would evaluate all operation and development decisions in light of the principles of natural and cultural conservation (sustainability). Wherever practicable, the National Park Service would promote environmentally sensitive planning and design and demonstrate technologies and practices that reduce environmental impacts and produce environmental benefits in energy conservation, solid waste management, transportation, water conservation and reclamation, and wastewater treatment. All future developments should be designed, built, and operated using the principles reflected in the National Park Service's *Guiding Principles of Sustainable Design* (NPS 1993).

"ANALYSIS OF IMPACTS ON PRIME AND UNIQUE AGRICULTURAL LANDS IN IMPLE- MENTING THE NATIONAL ENVIRON- MENTAL POLICY ACT" (45 CFR 59189)

Federal agencies are required to analyze the impacts of federal actions on agricultural lands, in accordance with the National Environmental Policy Act. This policy was developed to minimize the effect of federal programs in

converting prime, unique, or locally important farmland to nonagricultural uses. There are only a few patches of prime farmlands known to be within the upper riverway. Although NPS actions in the preferred alternative would not be expected to affect these lands, if NPS actions were taken in these areas, the National Park Service would strive to minimize impacts.

CULTURAL RESOURCE COMPLIANCE

The Antiquities Act of 1906 (PL 59-209, 16 U.S.C. 431-433, 34 Stat. 335): was the first general law providing protection for archeological resources. It protects all historic and prehistoric sites on federal lands and prohibits excavation or destruction of such antiquities without the permission (antiquities permit) of the secretary of the department having jurisdiction. It also authorizes the president to declare areas of public lands as national monuments and to reserve or accept lands for that purpose. Applicable regulation: 43 CFR 3, Antiquities Act of 1906.

The Historic Sites Act of 1935 (PL 74-292, 16 U.S.C. 461-467, 49 Stat. 666): declared "a national policy to preserve for public use historic sites, buildings, and objects . . . ;" authorized the programs known as the Historic American Building Survey, the Historic American Engineering Record, and the National Historic Landmark Survey; authorized the National Park Service to "restore, reconstruct, rehabilitate, preserve, and maintain historic or prehistoric sites, buildings, objects, and properties of national historical or archeological significance and . . . establish and maintain museums in connection therewith;" and authorized cooperative agreements with other parties to preserve and manage historic properties. Applicable regulations: 36 CFR 65, National Historic Landmarks and 36 CFR 68, DOI Standards for Historic Preservation.

The National Historic Preservation Act of 1966, as amended (PL 89-665, 80 Stat. 915; as amended by PL 91-243, 84 Stat. 204; PL 93-54;

PL 94-422, 90 Stat. 1313; PL 94-458; PL 96-199; PL 96-199; PL 96-244; PL 96-515, 94 Stat. 2987; PL 98-483; PL 99-514; PL 100-127 and PL 102-575, 16 U.S.C. 470-470t, 106 Stat. 4753) declared a national policy of historic preservation, including the encouragement of preservation on the state and private levels; authorized the secretary of the interior to expand and maintain a National Register of Historic Places, including properties of state and local, as well as national significance; authorized matching federal grants to the states and the National Trust for Historic Preservation for surveys and planning and for acquiring and developing national register properties; established the Advisory Council on Historic preservation; required federal agencies to consider the effects of their undertakings on national register properties and provide the advisory council opportunities to comment (section 106). Amended in 1976 (PL 94-422) to expand section 106 to properties eligible for, as well as listed in, the national register. Amended in 1980 (PL 96-515) to incorporate EO11593, requiring federal agencies to inventory federal resources, to protect historic resources, to give national historic landmarks extra protection in federal project planning, and to permit federal agencies to lease historic properties and apply the proceeds to any national register properties under their administration. Amended in 1992 to, among other things, redefine federal undertakings, address “anticipatory demolition,” and emphasize the interests and involvement of Native Americans and Native Hawaiians. Applicable regulations: 36 CFR 60, National Register of Historic Places; 36 CFR 65, National Historic Landmarks; 36 CFR 800 “Protection of Historic Properties” (Advisory Council on Historic Preservation); 36 CFR 801 “Urban Development Action Grant Program - Historic Preservation Requirements;” 36 CFR 61, Procedures for Approved State and Local Government Programs; and the *Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation*. EO 11593, “Protection and Enhancement of the Cultural Environment,” May 13, 1971 (36 CFR 8921); instructed all federal agencies to support the preservation of cultural properties; directed

them to identify and nominate to the national register cultural properties under their jurisdiction and to “exercise caution . . . to ensure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered.”

The Archeological and Historic Preservation Act of 1974 (PL 93-291; 16 U.S.C. 469-469c, 88 Stat. 174) amended the 1960 Reservoir Salvage Act and extended the provisions to all federal construction activities and all federally licensed or assisted activities. It provided for the preservation of significant scientific, prehistoric, historic, and archeological materials and data that might be lost or destroyed as a result of federally sponsored projects; provided that up to 1% of project costs could be applied to survey, data recovery, analysis, and publication. The National Historic Preservation Act authorizes additional funding for this purpose.

The Archaeological Resources Protection Act of 1979 (PL 96-95, 16 U.S.C. 470aa-470ll, 93 Stat. 721, PL 100-555, PL 100-588) supplements the provisions of the 1906 Antiquities Act. The law makes it illegal to excavate or remove from federal or Indian lands any archeological resources without a permit from the land manager. Permits may be issued only to educational or scientific institutions, and only if the resulting activities will increase knowledge about archeological resources. Major penalties for violating the law, both fines and imprisonment, are included. The act authorizes the secretary of the interior to promulgate regulations for the ultimate disposition of materials recovered as a result of permitted activities. Permits for archeological work on tribal lands cannot be issued without the consent of the tribe. The act also regulates the taking of archeological resources on federal lands, contains a permit system for excavating or removing archeological resources, and places prohibitions on the sale, purchase, transport or entry into interstate commerce of items taken in violation of the act. The law has been amended twice. PL 100-555 requires federal agencies to develop plans for surveying lands not scheduled

for projects and to develop and implement a uniform system for reporting and recording archeological violations. P. L. 100-588 lowers the felony threshold to \$500, adding attempts to loot or vandalize as a crime requiring federal land managers to develop public awareness programs.

The Native American Graves Protection and Repatriation Act of 1990 (PL 101-601, 25 U.S.C. 3001, 104 Stat. 3049) requires federal agencies and museums to inventory human remains and associated funerary objects and to provide culturally affiliated tribes with the inventory of collections. The act requires repatriation, on request, to the culturally affiliated tribes and establishes a grant program within the Department of the Interior to assist tribes and native Hawaiian organizations in repatriation and to assist museums in preparing the inventories and collections summaries. It also makes the sale or purchase of Native American human remains, whether or not they derive from federal or Indian lands, illegal.

The National Park Service will consult with the state historic preservation office(s) and with representatives of the Chippewa Nation on any undertaking that has the potential of affecting traditional cultural properties.

The National Park Service will work with all of the above entities to meet the requirements of 36 CFR 800 and the 1995 programmatic agreement among the National Conference of State Historic Preservation Officers, the advisory council, and the National Park Service. Under this agreement the National Park Service works closely with the state historic preservation office(s) and the advisory council in planning for new and existing national park system areas and allows for their review of the project agreement, public review draft, and final documents.

To ensure that proposals being considered in this document comply with the provisions of section 106, the advisory council and the state historic preservation office were invited to participate in the planning process. The state historic preservation office and the advisory council will have an

opportunity to review and comment on the *Draft General Management Plan / Environmental Assessment*.

Consultation with American Indian groups who historically occupied the area of the riverway also took place during the planning process. The tribes were invited to participate in this planning effort and will also have the opportunity to review and comment on the *Draft General Management Plan / Environmental Assessment*.

Based upon the data currently available for cultural resources on the St. Croix National Scenic Riverway, implementation of the preferred alternative would pose no impacts on the riverway's cultural resources. If in the future more specific actions were proposed in the riverway that posed potential impacts on prehistoric or historic resources, compliance with section 106 of the National Historic Preservation Act would also be carried out at that time.

ARCHITECTURAL BARRIERS ACT OF 1968 (42 USC 4151 ET SEQ.) AND REHABILITATION ACT OF 1973 (29 USC 701 ET SEQ.)

All facilities and programs developed would be accessible to visitors with disabilities as practicable, depending on the nature of the area and of the facility, to persons with visual, hearing, mobility, and mental impairments. It is not possible in the upper riverway to make all facilities, programs, and services available to all people at all times due to the nature of the riverway. The National Park Service would strive to provide the highest level of accessibility possible to buildings, facilities, programs, and services, consistent with the nature of the area, the conservation of riverway resources, and the mandate to provide a quality experience for everyone. Any new visitor or employee facility in developed areas, and any alterations to existing facilities, would be designed and constructed or rehabilitated in accordance with the *Uniform Federal Accessibility Standards* (49 FR 31528) to provide full

accessibility to visitors with disabilities. (See also the discussion of this topic under the “Actions Common to All Alternatives” section.

EXECUTIVE ORDER 12898, “FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS”

This order requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

For the purpose of fulfilling this executive order, in the context of the National Environmental Policy Act, the actions proposed in the preferred alternative in this plan were assessed during the planning process. It was determined that none of these actions would result in significant direct or indirect negative or adverse effects on any minority or low-income population or community.

The following facts contributed to this conclusion:

- The developments and actions proposed in the preferred alternative (alternative 1) would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect negative or adverse human health effects on any

minority or low-income population or community.

- The impacts on the natural and physical environment that would occur due to the implementation of the preferred alternative would not significantly and adversely affect any minority or low-income population or community.
- The preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The National Park Service has had an active public participation program and have equally considered all public input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Consultations were conducted with interested American Indian groups and no negative or adverse effects were identified that disproportionately and adversely affect these minority groups.
- Impacts on the socioeconomic environment due to implementing the preferred alternative would for the most part be positive and occur mostly within the geographic area along the length of the riverway and within nearby communities. These impacts would not occur at one time but would be spread over a period of years, thus mitigating their effects. Also impacts on the socioeconomic environment would not be expected to significantly alter the physical and social structure of local communities.

CONSULTATION AND COORDINATION

PLANNING GROUP AND ORGANIZATION INVOLVEMENT

The Minnesota and Wisconsin Departments of Natural Resources were actively involved as major consultants throughout the planning process. The Minnesota–Wisconsin Boundary Area Commission was also an integral player in the planning process. As a major landholder on the riverway, the Northern States Power Company was also consulted throughout the development of the general management plan. Along with the National Park Service, these entities (the Minnesota and Wisconsin Departments of Natural Resources, the Northern States Power Company, and the Minnesota–Wisconsin Boundary Area Commission) form the Upper St. Croix Management Commission, which is concerned with the management of the riverway and adjoining lands. Representatives of the Upper St. Croix Management Commission were key players throughout the planning process.

In April 1994 representatives from the riverway staff, the NPS Midwest Region, the NPS Denver Service Center, the Minnesota and Wisconsin Departments of Natural Resources, and the Minnesota–Wisconsin Boundary Area Commission met to determine the upper riverway issues to be included in the project task directive. This started the planning effort for the general management plan. In December 1995 the task directive was approved and signed by the superintendent of St. Croix National Scenic Riverway, the director of the Denver Service Center, and the director of the Midwest Region.

An interagency planning group — consisting of representatives from the riverway, the NPS Midwest Region, the Denver Service Center, the Minnesota and Wisconsin Departments of Natural Resources, the Minnesota–Wisconsin Boundary Area Commission, Northern States Power Company, and research consultants from the University of Minnesota — convened for a series of workshops throughout the planning

process. In February 1995 the planning group met to formulate the preliminary draft of the purposes and significance of the upper riverway, outline desired future conditions, and develop a list of issues. They also met in April 1995 to familiarize themselves with the landscape units of the riverway and outline preliminary management areas. They convened in September 1995 to develop a range of draft alternatives. In December 1995 a subgroup of the planning group met to discuss how standards and indicators might help in distinguishing the management areas. Also, in June 1996 the group met to select a draft preferred alternative. The interagency planning group was kept informed of the project progress through correspondence from the DSC project manager. Representatives from the various organizations and groups above have kept their respective agencies informed and involved throughout the planning process.

As the planning process evolved, numerous other parties were contacted. The Minnesota and Wisconsin state historic preservation officers and the Advisory Council on Historic Preservation were contacted as required by section 106 of the National Historic Preservation Act (as amended). Early consultation with the U.S. Fish and Wildlife Service was done regarding threatened and endangered species, as required by the Endangered Species Act. Contact with the St. Croix Chippewa Indians of Wisconsin was made early on in the process with an invitation to participate in the interagency planning group. Contact was maintained through mailings, informal meetings, and phone calls. The Great Lakes Indian Fish and Wildlife Commission was also consulted during the development of this plan.

PUBLIC INVOLVEMENT

Because of the complex make-up of the upper riverway — with state parks, state and county forests, municipalities, townships, and tribal lands and the diverse publics interested in the

future of the riverway — public involvement was an important aspect of the planning process. The general public, special interest groups, and local municipalities were kept informed of the progress of the planning effort and the results of the interagency planning group's workshops through a series of newsletters, a draft alternatives workbook, a series of open houses, press releases, informal meetings, and a review of the draft plan.

The first formal public involvement effort by the planning team was the April 1995 mailing of a scoping newsletter to all 223 individuals and/or entities who were then on the riverway's mailing list. To solicit broader participation, a press release was distributed to local and regional newspapers, and the newsletter was also available at riverway visitor centers.

Newsletter 1 explained the background of the project, described what a general management plan is and is not, explained the planning process and project schedule, outlined opportunities for public involvement throughout the process, and described how input from the public would be used. It also shared with the public the results of the planning team's first workshop, which were the draft purposes, significance, and exceptional resources and values of the upper riverway. The newsletter included a response form that asked for comments on the draft purpose and significance statements, for the reader's vision of the riverway in 20 years, and for any other concerns or issues the reader might have. Nineteen percent (43) of the response cards were returned.

The responses to *Newsletter 1* were diverse, but overall people expressed support for the riverway and the planning efforts. A very strong majority of respondents agreed with the purpose and significance statements for the upper riverway. Many wanted to see the riverway in the future as it is today, or with a few minor changes. These respondents wanted the St. Croix and Namekagon Rivers to continue to be free flowing and clean and providing a beautiful pristine setting where one can experience a sense of wilderness. Several respondents urged that no

further degradation of the riverway's resources be permitted. Access to the riverway was mentioned numerous times and is clearly a very important concern. Many riverway management actions were suggested, primarily focusing on campsite management.

Several opposing views were expressed by other respondents. Some people said current access to the riverway should be maintained, while others felt access should be controlled or reduced. Some wanted the Park Service to focus its efforts on protecting the river's natural values; others wanted to focus to be on providing recreational opportunities. Some people said that motorboats should be prohibited or limited on the upper riverway; others said motorboats should continue to have free movement. Some respondents urged that commercial and residential developments be kept away from the shoreline, while some landowners wanted to keep and improve their property in the riverway.

In November 1995 *Newsletter 2* was mailed out. The mailing list had increased to 256. The newsletter provided a planning update, a summary of the public responses to *Newsletter 1*, and a description of how the planning team was beginning work on alternative management strategies for the upper riverway; it also mentioned that the public's input would be sought on the management alternatives once they were crafted. No response form was included.

The planning team's preliminary range of alternatives for the riverway were distributed for public comment in March 1996 in the *Alternatives Workbook*. By this time interest in the project had increased and about 1,000 workbooks were distributed, either through the mail or from riverway visitor centers. The workbook repeated the purposes, significance, and exceptional resources and values of the upper riverway. It then outlined the actions common to all alternatives, gave descriptions of the four different management areas (zones), outlined the range of preliminary alternatives for future management of the riverway, and again outlined the next steps in the planning process and oppor-

tunities for public involvement. Included in the workbook was a response form that asked for comments on the preliminary alternatives and the planning process. About 350 response forms were returned.

Almost equal numbers of respondents supported alternatives C (which would emphasize protection of riverway resources) and D (which would continue management under the 1976 *Master Plan*). Those supporting alternative C believed it provided the best protection of resources and did the most to protect the environment, ecological integrity, solitude, and quiet. They also supported the idea of improving and restoring natural conditions. These respondents tended to want opportunities for quiet and near-wilderness experiences, to support increased management, and to favor additional restrictions on the type and amount of human activity on the riverway.

Alternative D was favored by those respondents who believed the existing *Master Plan* is working and that the status quo is fine. They were opposed to increased regulation or restrictions on motorboats and snowmobiles and to increased funding for managing the river. They see the riverway as a multiuse river that should be enjoyed by all. Some of these respondents felt that river users and river conditions should determine who can use it and where they can go.

A large number of respondents also supported alternative A, which would maintain existing resource conditions and visitor experiences on the riverway. People favoring this alternative believed the current situation is acceptable and that the current system is working. They believed current use levels and restrictions are tolerable. Respondents supporting alternative A felt that it had the best balance for all types of users.

Only a few respondents to the workbook supported alternative B, which would provide additional recreational opportunities on the riverway. These people favored increased use and recreational opportunities and more access to the river.

A relatively large number of people suggested variations of the above alternatives, combining different elements. Many of the proposed changes focused on motorboat use, either increasing or decreasing this use on different parts of the river (e.g., keeping the river open for motorboats but establishing no wake zones and putting limits on boat speeds). A few people wanted to change where zones were located in an alternative.

In August 1996 *Newsletter 4* was distributed to the public. About 1,000 were distributed through the mail or from riverway visitor centers. A press release in local newspapers also outlined the contents of the newsletter. The newsletter presented a summary of the public response to the March *Alternatives Workbook*, responded to some frequently mentioned concerns in the public responses, explained how public comments were being used, and outlined future opportunities for public participation in the planning effort. No response form was included.

During fall 1996, briefings were held with the St. Croix Chippewa Indians of Wisconsin, the Voyageurs Regional National Park Association, the Rotary Club, St. Croix Falls, and state and local land managers.

The National Park Service hosted a series of open houses in November 1996 and January 1997 to explain the alternatives and obtain public comment. The open houses were announced through press releases and mass mailings. Open houses were held in Danbury, Hayward, and Trego, Wisconsin, and Taylors Falls, St. Paul, and at the Marshland visitor center in Minnesota. The complete package of material presented at the open houses was also mailed to the more than 800 individuals and groups on the general management plan mailing list. A total of 111 people attended the seven open houses, and 82 responses were received through the mail.

Public comment from both the open houses and the mailed-back responses represented a wide range of topics of concern. Many individuals expressed concern over issues that are outside

the scope of the management plan, such as the federal court ban on trapping on NPS lands within the riverway. Several comments were very specific, such as trash along a particular stretch of the riverway, a campsite that should be closed to vehicular access, and where boat access needs improvement.

Comments that related to the management plan also varied widely. Although the majority supported the preferred alternative, many people expressed topics of concern relating to the preferred alternative. A few people supported alternative 2, while several people objected to it. About the same number supported and opposed alternative 3. Motorized access to the riverway was again a topic of concern with people either wanting more restrictions or wanting to leave it as it is. Overall access to the riverway was a concern, with some people wanting controlled access.

Numerous comments were voiced in support of the preservation of the natural qualities of the riverway, including the opportunities for quiet and solitude. And concerns were voiced about personal watercraft.

During the fall of 1997, this *Draft General Management Plan / Environmental Assessment*, which includes a preferred alternative, will be distributed for a 45-day public review. Comments on the draft plan will be analyzed, and appropriate changes will be made to the document in response to public comment. Various elements of the preferred alternative and other alternatives might be modified to address comments. Assuming no significant impacts become apparent during the public review period, a *Final General Management Plan* and "Finding of No Significant Impact" will then be issued.



APPENDIXES / BIBLIOGRAPHY / PREPARERS

APPENDIX A: LEGISLATION

¹An Act

To provide for a National Wild and Scenic Rivers System, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, (a) this Act may be cited as the "Wild and Scenic Rivers Act".

Congressional declaration of policy

(b) It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

Congressional declaration of purpose

(c) The purpose of this Act is to implement this policy by instituting a national wild and scenic rivers system, by designating the initial components of that system, and by prescribing the methods by which and standards according to which additional components may be added to the system from time to time.

Composition of system; requirements for State administered components

SEC. 2. (a) The national wild and scenic rivers system shall comprise rivers

(i) that are authorized for inclusion therein by Act of Congress, or

(ii) that are designated as wild, scenic or recreational rivers by or pursuant to an act of the legislature of the State or States through which they flow, that are to be permanently administered as wild, scenic or recreational rivers by an agency or political subdivision of the State or States concerned, that are found by the Secretary of the Interior, upon application of the Governor of the State or the Governors of the States concerned, or a person or persons thereunto duly appointed by him or them, to meet the criteria established in this Act and such criteria supplementary thereto as he may prescribe, and that are approved by him for

¹The Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) as set forth herein consists of Public Law 90-542 (October 2, 1968) and amendments thereto.

inclusion in the system, including, upon application of the Governor of the State concerned, the Allagash Wilderness Waterway, Maine; that segment of the Wolf River, Wisconsin, which flows through Langlade County and that segment of the New River in North Carolina extending from its confluence with Dog Creek downstream approximately 26.5 miles to the Virginia State line.

Upon receipt of an application under clause (ii) of this subsection, the Secretary shall notify the Federal Energy Regulatory Commission and publish such application in the Federal Register. Each river designated under clause (ii) shall be administered by the State or political subdivision thereof without expense to the United States other than for administration and management of federally owned lands. For purposes of the preceding sentence, amounts made available to any State or political subdivision under the Land and Water Conservation [Fund] Act of 1965 or any other provision of law shall not be treated as an expense to the United States. Nothing in this subsection shall be construed to provide for the transfer to, or administration by, a State or local authority of any federally owned lands which are within the boundaries of any river included within the system under clause (ii).

Classification

(b) A wild, scenic or recreational river area eligible to be included in the system is a free-flowing stream and the related adjacent land area that possesses one or more of the values referred to in Section 1, subsection (b) of this Act. Every wild, scenic or recreational river in its free-flowing condition, or upon restoration to this condition, shall be considered eligible for inclusion in the national wild and scenic rivers system and, if included, shall be classified, designated, and administered as one of the following:

- (1) Wild river areas--Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- (2) Scenic river areas--Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- (3) Recreational river areas--Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Congressionally designated components

SEC. 3. (a) The following rivers and the land adjacent thereto are hereby designated as components of the national wild and scenic rivers system:

(deletion - list of rivers)

Establishment of boundaries; classification

(b) The agency charged with the administration of each component of the national wild and scenic rivers system designated by subsection (a) of this section shall, within one year from the date of designation of such component under subsection (a) (except where a different date is provided in subsection (a)), establish detailed boundaries therefor (which boundaries shall include an average of not more than 320 acres of land per mile measured from the ordinary high water mark on both sides of the river); and determine which of the classes outlined in section 2, subsection (b), of this Act best fit the river or its various segments. Notice of the availability of the boundaries and classification, and of subsequent boundary amendments shall be published in the Federal Register and shall not become effective until ninety days after they have been forwarded to the President of the Senate and the Speaker of the House of Representatives.

Public availability of maps and descriptions

(c) Maps of all boundaries and descriptions of the classifications of designated river segments, and subsequent amendments to such boundaries, shall be available for public inspection in the offices of the administering agency in the District of Columbia and in locations convenient to the designated river.

Review requirements for early designations and management plans

(d)(1) For rivers designated on or after January 1, 1986, the Federal agency charged with the administration of each component of the National Wild and Scenic Rivers System shall prepare a comprehensive management plan for such river segment to provide for the protection of the river values. The plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act. The plan shall be coordinated with and may be incorporated into resource management planning for affected adjacent Federal lands. The plan shall be prepared, after consultation with State and local governments and the interested public within 3 full fiscal years after the date of designation. Notice of the completion and availability of such plans shall be published in the Federal Register.

(2) For rivers designated before January 1, 1986, all boundaries, classifications, and plans shall be reviewed for conformity within the requirements of this subsection within 10 years through regular agency planning processes.

Requirements for study reports

SEC. 4. (a) The Secretary of the Interior or, where national forest lands are involved, the Secretary of Agriculture or, in appropriate cases, the two Secretaries jointly shall study and submit to the President reports on the suitability or unsuitability for addition to the national wild and scenic rivers system of rivers which are designated herein or hereafter by the Congress as potential

additions to such system. The President shall report to the Congress his recommendations and proposals with respect to the designation of each such river or section thereof under this Act. Such studies shall be completed and such reports shall be made to the Congress with respect to all rivers named in subparagraphs 5(a) (1) through (27) of this Act no later than October 2, 1978. In conducting these studies the Secretary of the Interior and the Secretary of Agriculture shall give priority to those rivers

- (i) with respect to which there is the greatest likelihood of developments which, if undertaken, would render the rivers unsuitable for inclusion in the national wild and scenic rivers system, and
- (ii) which possess the greatest proportion of private lands within their areas. Every such study and plan shall be coordinated with any water resources planning involving the same river which is being conducted pursuant to the Water Resources Planning Act (79 Stat. 244; 42 U.S.C. 1962 et seq.). Each report, including maps and illustrations, shall show among other things the area included within the report; the characteristics which do or do not make the area a worthy addition to the system; the current status of land ownership and use in the area; the reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the national wild and scenic rivers system; the Federal agency (which in the case of a river which is wholly or substantially within a national forest, shall be the Department of Agriculture) by which it is proposed the area, should it be added to the system, be administered; the extent to which it is proposed that such administration, including the costs thereof, be shared by State and local agencies; and the estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system. Each such report shall be printed as a Senate or House document.

(b) Before submitting any such report to the President and the Congress, copies of the proposed report shall, unless it was prepared jointly by the Secretary of the Interior and the Secretary of Agriculture, be submitted by the Secretary of the Interior to the Secretary of Agriculture or by the Secretary of Agriculture to the Secretary of the Interior, as the case may be, and to the Secretary of the Army, the Secretary of Energy, the head of any other affected Federal department or agency and, unless the lands proposed to be included in the area are already owned by the United States or have already been authorized for acquisition by Act of Congress, the Governor of the State or States in which they are located or an officer designated by the Governor to receive the same. Any recommendations or comments on the proposal which the said officials furnish the Secretary or Secretaries who prepared the report within ninety days of the date on which the report is submitted to them, together with the Secretary's or Secretaries' comments thereon, shall be included with the transmittal to the President and the Congress.

Review requirements for State components

(c) Before approving or disapproving for inclusion in the national wild and scenic rivers system any river designated as a wild, scenic or recreational river by or pursuant to an act of the State legislature, the Secretary of the Interior shall submit the proposal to the Secretary of Agriculture, the Secretary of the Army, the Secretary of Energy, and the head of any other

affected Federal department or agency and shall evaluate and give due weight to any recommendations or comments which the said officials furnish him within ninety days of the date on which it is submitted to them. If he approves the proposed inclusion, he shall publish notice thereof in the Federal Register.

Study boundaries

(d) The boundaries of any river proposed in section 5(a) of this Act for potential addition to the National Wild and Scenic Rivers System shall generally comprise that area measured within one-quarter mile from the ordinary high water mark on each side of the river. In the case of any designated river, prior to publication of boundaries pursuant to section 3(b) of this Act, the boundaries also shall comprise the same area. This subsection shall not be construed to limit the possible scope of the study report to address areas which may lie more than one-quarter mile from the ordinary high water mark on each side of the river.

Study rivers

SEC. 5 (a) The following rivers are hereby designated for potential addition to the national wild and scenic rivers system:

(deletion - list of rivers and study periods)

Additional study requirements

(c) The study of any of said rivers shall be pursued in as close cooperation with appropriate agencies of the affected State and its political subdivisions as possible, shall be carried on jointly with such agencies if request for such joint study is made by the State, and shall include a determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the national wild and scenic rivers system.

Federal agency consideration of wild and scenic values

(d)(1) In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potentials. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources

by all Federal agencies as potential alternative uses of the water and related land resources involved.

(2) The Congress finds that the Secretary of the Interior, in preparing the Nationwide Rivers Inventory as a specific study for possible additions to the national wild and scenic rivers system, identified the Upper Klamath River from below the John Boyle Dam to the Oregon-California State line. The Secretary, acting through the Bureau of Land Management, is authorized under this subsection to complete a study of the eligibility and suitability of such segment for potential addition to the national wild and scenic rivers system. Such study shall be completed, and a report containing the results of the study shall be submitted to Congress by April 1, 1990. Nothing in this paragraph shall affect the authority or responsibilities of any other Federal agency with respect to activities or action on this segment and its immediate environment.

Acquisition procedures and limitations

SEC. 6. (a)(1) The Secretary of the Interior and the Secretary of Agriculture are each authorized to acquire lands and interests in land within the authorized boundaries of any component of the national wild and scenic rivers system designated in section 3 of this Act, or hereafter designated for inclusion in the system by Act of Congress, which is administered by him, but he shall not acquire fee title to an average of more than 100 acres per mile on both sides of the river. Lands owned by a State may be acquired only by donation or by exchange in accordance with the subsection (d) of this section. Lands owned by an Indian tribe or a political subdivision of a State may not be acquired without the consent of the appropriate governing body thereof as long as the Indian tribe or political subdivision is following a plan for management and protection of the lands which the Secretary finds protects the land and assures its use for purposes consistent with this Act. Money appropriated for Federal purposes from the land and water conservation fund shall, without prejudice to the use of appropriations from other sources, be available to Federal departments and agencies for the acquisition of property for the purposes of this Act.

(2) When a tract of land lies partially within and partially outside the boundaries of a component of the national wild and scenic rivers system, the appropriate Secretary may, with the consent of the landowners for the portion outside the boundaries, acquire the entire tract. The land or interest therein so acquired outside the boundaries shall not be counted against the average one-hundred-acre-per-mile fee title limitation of subsection (a)(1). The lands or interests therein outside such boundaries, shall be disposed of, consistent with existing authorities of law, by sale, lease, or exchange.

(b) If 50 per centum or more of the entire acreage outside the ordinary high water mark on both sides of the river within a federally administered wild, scenic or recreational river area is owned in fee title by the United States, by the State or States within which it lies, or by political subdivisions of those States, neither Secretary shall acquire fee title to any lands by condemnation under authority of this Act. Nothing contained in this section, however, shall preclude the use of condemnation when necessary to clear title or to acquire scenic easements or such other easements as are reasonably necessary to give the public access to the river and to permit its members to traverse the length of the area or of selected segments thereof.

(c) Neither the Secretary of the Interior nor the Secretary of Agriculture may acquire lands by condemnation, for the purpose of including such lands in any national wild, scenic or recreational river area, if such lands are located within any incorporated city, village or borough which has in force and applicable to such lands a duly adopted, valid zoning ordinance that conforms with the purposes of this Act. In order to carry out the provisions of this subsection the appropriate Secretary shall issue guidelines, specifying standards for local zoning ordinances, which are consistent with the purposes of this Act. The standards specified in such guidelines shall have the object of

(A) prohibiting new commercial or industrial uses other than commercial or industrial uses which are consistent with the purposes of this Act, and

(B) the protection of the bank lands by means of acreage, frontage, and setback requirements on development.

(d) The appropriate Secretary is authorized to accept title to non-Federal property within the authorized boundaries of any federally administered component of the national wild and scenic rivers system designated in section 3 of this Act or hereafter designated for inclusion in the system by Act of Congress and, in exchange therefor, convey to the grantor any federally owned property which is under his jurisdiction within the State in which the component lies and which he classifies as suitable for exchange or other disposal. The values of the properties so exchanged either shall be approximately equal or, if they are not approximately equal, shall be equalized by the payment of cash to the grantor or to the Secretary as the circumstances require.

(e) The head of any Federal department or agency having administrative jurisdiction over any lands or interests in land within the authorized boundaries of any federally administered component of the national wild and scenic rivers system designated in section 3 of this Act or hereafter designated for inclusion in the system by Act of Congress is authorized to transfer to the appropriate Secretary jurisdiction over such lands for administration in accordance with the provisions of this Act. Lands acquired by or transferred to the Secretary of Agriculture for the purposes of this Act within or adjacent to a national forest shall upon such acquisition or transfer become national forest lands.

(f) The appropriate Secretary is authorized to accept donations of lands and interests in land, funds, and other property for use in connection with his administration of the national wild and scenic rivers system.

(g)(1) Any owner or owners (hereinafter in this subsection referred to as "owner") of improved property on the date of its acquisition, may retain for themselves and their successors or assigns a right of use and occupancy of the improved property for noncommercial residential purposes for a definite term not to exceed twenty-five years, or in lieu thereof, for a term ending at the death of the owner, or the death of his spouse, or the death of either or both of them. The owner shall elect the term to be reserved. The appropriate Secretary shall pay to the owner the fair market value of the property on the date of such acquisition less the fair market value on such a date of the right retained by the owner.

(2) A right of use and occupancy retained pursuant to this subsection shall be subject to termination whenever the appropriate Secretary is given reasonable cause to find that such use and occupancy is being exercised in a manner which conflicts with the purposes of this Act. In the event of such a finding, the Secretary shall tender to the holder of that right an amount equal to

the fair market value of that portion of the right which remains unexpired on the date of termination. Such right of use or occupancy shall terminate by operation of law upon tender of the fair market price.

(3) The term "improved property", as used in this Act, means a detached, one-family dwelling (hereinafter referred to as "dwelling"), the construction of which was begun before January 1, 1967, (except where a different date is specifically provided by law with respect to any particular river), together with so much of the land on which the dwelling is situated, the said land being in the same ownership as the dwelling, as the appropriate Secretary shall designate to be reasonably necessary for the enjoyment of the dwelling for the sole purpose of noncommercial residential use, together with any structures accessory to the dwelling which are situated on the land so designated.

Restrictions on hydro and water resource development projects on designated rivers

SEC. 7. (a) The Federal Power Commission [FERC] shall not license the construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the Federal Power Act (41 Stat. 1063), as amended (16 U.S.C. 791a et seq.), on or directly affecting any river which is designated in section 3 of this Act as a component of the national wild and scenic rivers system or which is hereafter designated for inclusion in that system, and no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration. Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above a wild, scenic or recreational river area or on any stream tributary thereto which will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date of designation of a river as a component of the national wild and scenic rivers system. No department or agency of the United States shall recommend authorization of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration, or request appropriations to begin construction of any such project, whether heretofore or hereafter authorized, without advising the Secretary of the Interior or the Secretary of Agriculture, as the case may be, in writing of its intention so to do at least sixty days in advance, and without specifically reporting to the Congress in writing at the time it makes its recommendation or request in what respect construction of such project would be in conflict with the purposes of this Act and would affect the component and the values to be protected by it under this Act. Any license heretofore or hereafter issued by the Federal Power Commission [FERC] affecting the New River of North Carolina shall continue to be effective only for that portion of the river which is not included in the national wild and scenic rivers system pursuant to section 2 of this Act and no project or undertaking so licensed shall be permitted to invade, inundate or otherwise adversely affect such river segment.

Restrictions on hydro and water resource development projects on study rivers

(b) The Federal Power Commission [FERC] shall not license the construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the Federal Power Act, as amended, on or directly affecting any river which is listed in section 5, subsection (a), of this Act, and no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river might be designated, as determined by the Secretary responsible for its study or approval--

(i) during the ten-year period following enactment of this Act [October 2, 1968] or for a three complete fiscal year period following any Act of Congress designating any river for potential addition to the national wild and scenic rivers system, whichever is later, unless, prior to the expiration of the relevant period, the Secretary of the Interior and where national forest lands are involved, the Secretary of Agriculture, on the basis of study, determine that such river should not be included in the national wild and scenic rivers system and notify the Committees on Interior and Insular Affairs of the United States Congress, in writing, including a copy of the study upon which the determination was made, at least one hundred and eighty days while Congress is in session prior to publishing notice to that effect in the Federal Register: *Provided*, That if any Act designating any river or rivers for potential addition to the national wild and scenic rivers system provides a period for the study or studies which exceeds such three complete fiscal year period the

period provided for in such Act shall be substituted for the three complete fiscal year period in the provisions of this clause (i); and

(ii) during such interim period from the date a report is due and the time a report is actually submitted to the Congress; and

(iii) during such additional period thereafter as, in the case of any river the report for which is submitted to the President and the Congress for inclusion in the national wild and scenic rivers system, is necessary for congressional consideration thereof or, in the case of any river recommended to the Secretary of the Interior for inclusion in the national wild and scenic rivers system under section 2(a)(ii) of this Act, is necessary for the Secretary's consideration thereof, which additional period, however, shall not exceed three years in the first case and one year in the second.

Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above a potential wild, scenic or recreational river area or on any stream tributary thereto which will not invade the area or diminish the scenic, recreational, and fish and wildlife values present in the potential wild, scenic or recreational river area on the date of designation of a river for study as provided in section 5 of this Act. No department or agency of the United States shall, during the periods hereinbefore specified, recommend authorization of any water resources project on any such river or request appropriations to begin construction of any such project, whether heretofore or hereafter authorized, without advising the Secretary of the Interior and, where national forest lands are involved, the Secretary of Agriculture in writing of its intention so to do at least sixty days in advance of doing so and without specifically reporting

to the Congress in writing at the time it makes its recommendation or request in what respect construction of such project would be in conflict with the purposes of this Act and would affect the component and the values to be protected by it under this Act.

(c) The Federal Power Commission [FERC] and all other Federal agencies shall, promptly upon enactment of this Act, inform the Secretary of the Interior and, where national forest lands are involved, the Secretary of Agriculture, of any proceedings, studies, or other activities within their jurisdiction which are now in progress and which affect or may affect any of the rivers specified in section 5, subsection (a), of this Act. They shall likewise inform him of any such proceedings, studies, or other activities which are hereafter commenced or resumed before they are commenced or resumed.

Grants under Land and Water Conservation Fund Act of 1965

(d) Nothing in this section with respect to the making of a loan or grant shall apply to grants made under the Land and Water Conservation Fund Act of 1965 (78 Stat. 897; 16 U.S.C. 4601-5 et seq.).

Limitations to entry on Public Lands

(a) Designated rivers

SEC. 8. (a) All public lands within the authorized boundaries of any component of the national wild and scenic rivers system which is designated in section 3 of this Act or which is hereafter designated for inclusion in that system are hereby withdrawn from entry, sale, or other disposition under the public land laws of the United States. This subsection shall not be construed to limit the authorities granted in section 6(d) or section 14A of this Act.

(b) Study rivers

(b) All public lands which constitute the bed or bank, or are within one-quarter mile of the bank, of any river which is listed in section 5, subsection (a), of this Act are hereby withdrawn from entry, sale, or other disposition under the public land laws of the United States for the periods specified in section 7, subsection (b), of this Act. Notwithstanding the foregoing provisions of this subsection or any other provision of this Act, subject only to valid existing rights, including valid Native selection rights under the Alaska Native Claims Settlement Act, all public lands which constitute the bed or bank, or are within an area extending two miles from the bank of the river channel on both sides of the river segments referred to in paragraphs (77) through (88) of section 5(a) are hereby withdrawn from entry, sale, State selection or other disposition under the public land laws of the United States for the periods specified in section 7(b) of this Act.

Limitations on mineral entry and development on Public Lands; designated rivers

SEC. 9. (a) Nothing in this Act shall affect the applicability of the United States mining and mineral leasing laws within components of the national wild and scenic rivers system except that--

- (i) all prospecting, mining operations, and other activities on mining claims which, in the case of a component of the system designated in section 3 of this Act, have not heretofore been perfected or which, in the case of a component hereafter designated pursuant to this Act or any other Act of Congress, are not perfected before its inclusion in the system and all mining operations and other activities under a mineral lease, license, or permit issued or renewed after inclusion of a component in the system shall be subject to such regulations as the Secretary of the Interior or, in the case of national forest lands, the Secretary of Agriculture may prescribe to effectuate the purposes of this Act;
- (ii) subject to valid existing rights, the perfection of, or issuance of a patent to, any mining claim affecting lands within the system shall confer or convey a right or title only to the mineral deposits and such rights only to the use of the surface and the surface resources as are reasonably required to carrying on prospecting or mining operations and are consistent with such regulations as may be prescribed by the Secretary of the Interior, or in the case of national forest lands, by the Secretary of Agriculture; and
- (iii) subject to valid existing rights, the minerals in Federal lands which are part of the system and constitute the bed or bank or are situated within one-quarter mile of the bank of any river designated a wild river under this Act or any subsequent Act are hereby withdrawn from all forms of appropriation under the mining laws and from operation of the mineral leasing laws including, in both cases, amendments thereto.

Regulations issued pursuant to paragraphs (i) and (ii) of this subsection shall, among other things, provide safeguards against pollution of the river involved and unnecessary impairment of the scenery within the component in question.

Study rivers

(b) The minerals in any Federal lands which constitute the bed or bank or are situated within one-quarter mile of the bank of any river which is listed in section 5, subsection (a) of this Act are hereby withdrawn from all forms of appropriation under the mining laws during the periods specified in section 7, subsection (b) of this Act. Nothing contained in this subsection shall be construed to forbid prospecting or the issuance of leases, licenses, and permits under the mineral leasing laws subject to such conditions as the Secretary of the Interior and, in the case of national forest lands, the Secretary of Agriculture find appropriate to safeguard the area in the event it is subsequently included in the system. Notwithstanding the foregoing provisions of this subsection or any other provision of this Act, all public lands which constitute the bed or bank, or are within an area extending two miles from the bank of the river channel on both sides of the river segments referred to in paragraphs (77) through (88) of section 5(a), are hereby withdrawn, subject to valid existing rights, from all forms of appropriation under the mining laws and from operation of the mineral leasing laws including, in both cases, amendments thereto, during the periods specified in section 7(b) of this Act.

Management direction

SEC. 10. (a) Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its aesthetic, scenic, historic, archaeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.

(b) Any portion of a component of the national wild and scenic rivers system that is within the national wilderness preservation system, as established by or pursuant to the Act of September 3, 1964 (78 Stat. 890; 16 U.S.C., ch. 23),² shall be subject to the provisions of both the Wilderness Act and this Act with respect to preservation of such river and its immediate environment, and in case of conflict between the provisions of these Acts the more restrictive provisions shall apply.

(c) Any component of the national wild and scenic rivers system that is administered by the Secretary of the Interior through the National Park Service shall become a part of the national park system, and any such component that is administered by the Secretary through the Fish and Wildlife Service shall become a part of the national wildlife refuge system. The lands involved shall be subject to the provisions of this Act and the Acts under which the national park system or national wildlife refuge system, as the case may be, is administered, and in case of conflict between the provisions of these Acts, the more restrictive provisions shall apply. The Secretary of the Interior, in his administration of any component of the national wild and scenic rivers system, may utilize such general statutory authorities relating to areas of the national park system and such general statutory authorities otherwise available to him for recreation and preservation purposes and for the conservation and management of natural resources as he deems appropriate to carry out the purposes of this Act.

(d) The Secretary of Agriculture, in his administration of any component of the national wild and scenic rivers system area, may utilize the general statutory authorities relating to the national forests in such manner as he deems appropriate to carry out the purposes of this Act.

(e) The Federal agency charged with the administration of any component of the national wild and scenic rivers system may enter into written cooperative agreements with the Governor of a State, the head of any State agency, or the appropriate official of a political subdivision of a State for State or local governmental participation in the administration of the component. The States and their political subdivisions shall be encouraged to cooperate in the planning and administration of components of the system which include or adjoin State or county-owned lands.

² Refers to "the Wilderness Act."

Federal assistance to others; cooperation; use of volunteers

SEC. 11. (a) The Secretary of the Interior shall encourage and assist the States to consider, in formulating and carrying out their comprehensive statewide outdoor recreation plans and proposals for financing assistance for State and local projects submitted pursuant to the Land and Water Conservation Fund Act of 1965 (78 Stat. 897), needs and opportunities for establishing State and local wild, scenic and recreational river areas.

(b)(1) The Secretary of the Interior, the Secretary of Agriculture, or the head of any other Federal agency, shall assist, advise, and cooperate with States or their political subdivisions, landowners, private organizations, or individuals to plan, protect, and manage river resources. Such assistance, advice and cooperation may be through written agreements or otherwise. This authority applies within or outside a federally administered area and applies to rivers which are components of the national wild and scenic rivers system and to other rivers. Any agreement under this subsection may include provisions for limited financial or other assistance to encourage participation in the acquisition, protection, and management of river resources.

(2) Wherever appropriate in furtherance of this Act, the Secretary of Agriculture and the Secretary of the Interior are authorized and encouraged to utilize the following:

(A) For activities on federally owned land, the Volunteers in the Parks Act of 1969 (16 U.S.C. 18g-j) and the Volunteers in the Forest Act of 1972 (16 U.S.C. 558a-558d).

(B) For activities on all other lands, section 6 of the Land and Water Conservation Fund Act of 1965 (relating to the development of statewide comprehensive outdoor recreation plans).

(3) For purposes of this subsection, the appropriate Secretary or the head of any Federal agency may utilize and make available Federal facilities, equipment, tools and technical assistance to volunteers and volunteer organizations, subject to such limitations and restrictions as the appropriate Secretary or the head of any Federal agency deems necessary or desirable.

(4) No permit or other authorization provided for under provision of any other Federal law shall be conditioned on the existence of any agreement provided for in this section.

Management policies

SEC. 12. (a) The Secretary of the Interior, the Secretary of Agriculture, and the head of any other Federal department or agency having jurisdiction over any lands which include, border upon, or are adjacent to, any river included within the National Wild and Scenic Rivers System or under consideration for such inclusion, in accordance with section 2(a)(ii), 3(a), or 5(a), shall take such action respecting management policies, regulations, contracts, plans, affecting such lands, following November 10, 1978, as may be necessary to protect such rivers in accordance with the purposes of this Act. Such Secretary or other department or agency head shall, where appropriate, enter into written cooperative agreements with the appropriate State or local official for the planning, administration, and management of Federal lands which are within the boundaries of any rivers for which approval has been granted under section 2(a)(ii). Particular

attention shall be given to scheduled timber harvesting, road construction, and similar activities which might be contrary to the purposes of this Act.

(b) Nothing in this section shall be construed to abrogate any existing rights, privileges, or contracts affecting Federal lands held by any private party without the consent of said party.

(c) The head of any agency administering a component of the national wild and scenic rivers system shall cooperate with the Administrator, Environmental Protection Agency and with the appropriate State water pollution control agencies for the purpose of eliminating or diminishing the pollution of waters of the river.

Reservation of State and Federal jurisdiction and responsibilities;
access to and across wild and scenic rivers

SEC. 13. (a) Nothing in this Act shall affect the jurisdiction or responsibilities of the States with respect to fish and wildlife. Hunting and fishing shall be permitted on lands and waters administered as parts of the system under applicable State and Federal laws and regulations unless, in the case of hunting, those lands or waters are within a national park or monument. The administering Secretary may, however, designate zones where, and establish periods when, no hunting is permitted for reasons of public safety, administration, or public use and enjoyment and shall issue appropriate regulations after consultation with the wildlife agency of the State or States affected.

(b) The jurisdiction of the States and the United States over waters of any stream included in the national wild, scenic or recreational river area shall be determined by established principles of law. Under the provisions of this Act, any taking by the United States of a water right which is vested under either State or Federal law at the time such river is included in the national wild and scenic rivers system shall entitle the owner thereof to just compensation. Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(c) Designation of any stream or portion thereof as a national wild, scenic or recreational river area shall not be construed as a reservation of the waters of such streams for purposes other than those specified in this Act, or in quantities greater than necessary to accomplish these purposes.

(d) The jurisdiction of the States over waters of any stream included in a national wild, scenic or recreational river area shall be unaffected by this Act to the extent that such jurisdiction may be exercised without impairing the purposes of this Act or its administration.

(e) Nothing contained in this Act shall be construed to alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by any States which contain any portion of the national wild and scenic rivers system.

(f) Nothing in this Act shall affect existing rights of any State, including the right of access, with respect to the beds of navigable streams, tributaries, or rivers (or segments thereof) located in a national wild, scenic or recreational river area.

(g) The Secretary of the Interior or the Secretary of Agriculture, as the case may be, may grant easements and rights-of-way upon, over, under, across, or through any component of the

national wild and scenic rivers system in accordance with the laws applicable to the national park system and the national forest system, respectively: *Provided*, That any conditions precedent to granting such easements and rights-of-way shall be related to the policy and purpose of this Act.

Land donations

SEC. 14. The claim and allowance of the value of an easement as a charitable contribution under section 170 of title 26, United States Code, or as a gift under section 2522 of said title shall constitute an agreement by the donor on behalf of himself, his heirs, and assigns that, if the terms of the instrument creating the easement are violated, the donee or the United States may acquire the servient estate at its fair market value as of the time the easement was donated minus the value of the easement claimed and allowed as a charitable contribution or gift.

Lease of Federal lands

SEC. 14A. (a) Where appropriate in the discretion of the Secretary, he may lease federally owned land (or any interest therein) which is within the boundaries of any component of the national wild and scenic rivers system and which has been acquired by the Secretary under this Act. Such lease shall be subject to such restrictive covenants as may be necessary to carry out the purposes of this Act.

(b) Any land to be leased by the Secretary under this section shall be offered first for such lease to the person who owned such land immediately before its acquisition by the United States.

Exceptions for Alaska

SEC. 15. Notwithstanding any other provision to the contrary in sections 3 and 9 of this Act, with respect to components of the national wild and scenic rivers system in Alaska designated by paragraphs (38) through (50) of section 3(a) of this Act--

(1) the boundary of each such river shall include an average of not more than six hundred and forty acres per mile on both sides of the river. Such boundary shall not include any lands owned by the State or a political subdivision of the State nor shall such boundary extend around any private lands adjoining the river in such manner as to surround or effectively surround such private lands; and

(2) the withdrawal made by paragraph (iii) of section 9(a) shall apply to the minerals in Federal lands which constitute the bed or bank or are situated within one-half mile of the bank of any river designated a wild river by the Alaska National Interest Lands Conservation Act.

Definitions

SEC. 16. As used in this Act, the term--

(a) "River" means a flowing body of water or estuary or a section, portion, or tributary thereof, including rivers, streams, creeks, runs, kills, rills, and small lakes.

(b) "Free-flowing", as applied to any river or section of a river, means existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures at the time any river is proposed for inclusion in the national wild and scenic rivers system shall not automatically bar its consideration for such inclusion: *Provided*, That this shall not be construed to authorize, intend, or encourage future construction of such structures within components of the national wild and scenic rivers system.

(c) "Scenic easement" means the right to control the use of land (including the air space above such land) within the authorized boundaries of a component of the wild and scenic rivers system, for the purpose of protecting the natural qualities of a designated wild, scenic or recreational river area, but such control shall not affect, without the owner's consent, any regular use exercised prior to the acquisition of the easement. For any designated wild and scenic river, the appropriate Secretary shall treat the acquisition of fee title with the reservation of regular existing uses to the owner as a scenic easement for purposes of this Act. Such an acquisition shall not constitute fee title ownership for purposes of section 6(b).

Authorization of appropriations for land acquisition

SEC. 17. There are hereby authorized to be appropriated, including such sums as have heretofore been appropriated, the following amounts for land acquisition for each of the rivers described in section 3(a) of this Act:

Clearwater, Middle Fork, Idaho, \$2,909,800;
 Eleven Point, Missouri, \$10,407,000;
 Feather, Middle Fork, California, \$3,935,700;
 Rio Grande, New Mexico, \$253,000;
 Rogue, Oregon, \$15,147,000
 St. Croix, Minnesota and Wisconsin, \$21,769,000;
 Salmon, Middle Fork Idaho, \$1,837,000; and
 Wolf Wisconsin, \$142,150.

94 STAT. 3370

PUBLIC LAW 96-580—DEC. 23, 1980

Public Law 96-580
96th Congress

An Act

Dec. 23, 1980
[S. 3096]

To amend the Wild and Scenic Rivers Act to authorize the acquisition of certain lands in Douglas County, Wisconsin.

Wild and Scenic
Rivers Act,
amendment.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That paragraph (6) of section 3(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1274) is amended by adding at the end thereof the following new sentence: "A one-thousand-three-hundred-and-eighty-acre portion of the area commonly known as the Velie Estate, located adjacent to the Saint Croix River in Douglas County, Wisconsin, as depicted on the map entitled 'Boundary Map/Velie Estate—Saint Croix National Scenic Riverway', dated September 1980, and numbered 630-90,001, may be acquired by the Secretary without regard to any acreage limitation set forth in subsection (b) of this section or subsection (a) or (b) of section 6 of this Act."

Approved December 23, 1980.

LEGISLATIVE HISTORY:

SENATE REPORT No. 96-1024 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 126 (1980):
Dec. 9, considered and passed Senate.
Dec. 10, considered and passed House.

APPENDIX B: DESIRED FUTURE CONDITIONS FOR THE UPPER RIVERWAY

Early in the planning process the planning team, made up of the National Park Service, the Minnesota and Wisconsin Departments of Natural Resources, the Minnesota–Wisconsin Boundary Area Commission, and Northern States Power Company, met to prepare desired future conditions for the riverway. The desired future conditions express a vision for the riverway in the next 15 years and formed the basis for the alternatives that are presented in this document. The following is the initial list of desired future conditions that the planning team drafted.

DESIRED FUTURE CONDITIONS

COMMUNITY RELATIONS:

- There are fewer conflicts concerning the riverway's existence than there were 20 years ago.
- Partnerships are the norm in the management of the riverway and the watershed.
- All stakeholders in the watershed are partners in managing the riverway.
- A broad spectrum of stakeholders understand and have ownership in a common vision, including an understanding of their interconnectedness.
- Adjacent private landowners and visitors respect each others rights.

OPERATIONS:

- The riverway and its NPS staff are highly valued members of the upper valley community.
- The riverway staff are recognized and respected for their knowledge, professionalism, and dedication to efficient public service.
- The riverway has the fiscal, physical, and human resources to carry out our management objectives (i.e., identify current and future threats, maintain facilities and natural resources, and provide basic protection and information/education services).
- Management actions affecting riverway resources are made based on and consistent with the latest scientific data and methods, including geographic information systems (GIS).

- Facilities are completed and maintained at a level sufficient to provide for the visitor and ensure the preservation of the riverway's significant resources.
- The riverway staff has accomplished a sustained, high level of coordination and cooperation with other managing partners (state, tribal, Northern States Power Company, etc.).

NATURAL RESOURCES:

- The species listed in 1995 as threatened or endangered are now stable components of the riverway's ecosystem.
- Water quality is exceptional and supports abundant and diverse populations of fish and aquatic life. Water quantity is adequate to support riverway purposes.
- Air quality has improved from 1995.
- The St. Croix ecosystem has been protected and enhanced to allow the ecosystem (and listed species) to perpetuate with minimal human influence.
- Exotic species have been controlled to the extent they have a minimal impact on the ecosystem or they have been completely eliminated.
- Natural processes (systems) have been reestablished on the rivers.
- Nonnative fish are managed in ways that are compatible with retaining a healthy native fish population.
- The resource should include abundant wildlife with large predators (e.g., eagles, wolves, bobcat, bear, and coyote).
- The freshwater mussel species diversity is the same as it was 20 years ago.
- Major highway and utility crossings are allowed, without a proliferation of visual intrusions (something less than today), and no new structures (e.g., bridges, dams, transmission lines) are allowed. Also, some structures for crossing the river have been removed, enabling additional segments of the river to be restored to a free-flowing condition.
- The river flows through a corridor that is still in a relatively natural state with little development visible from the river and development is compatible with the exceptional resources and values of the river.

- Bank/shoreline erosion is limited and caused by natural effects, not human impacts.
- Recreational use is in harmony with the riverway's exceptional natural, scenic, aesthetic, and recreational values.

VISITOR EXPERIENCE AND USE:

- Visitors have opportunities to take risks.
- There is the opportunity to use boats with small motors.
- Visitors have opportunities to see a variety of native wildlife and habitats.
- Riverway visitors enjoy high-quality riverine recreational experiences, including quiet, solitude, and beauty.
- Riverway users experience a piece of primitive America.
- Families can find safe, enjoyable experiences on the river.
- Visitors and their property are safe from criminal acts during their stay in the riverway.
- The riverway accommodates as many users as possible up to the riverway's carrying capacity.
- There are minimum conflicts between recreational user groups.
- Canoeists have a reasonable opportunity to find primitive campsites.
- The visitor experience is not degraded by overregulation or inconsistent regulations.
- All visitors have an opportunity to be exposed to the riverway's interpretive themes.
- Interpretation facilitates stewardship of the riverway.
- Commercial operators are involved with the interpretation of the riverway.
- There is a consistent, coordinated message by all riverway interpreters.
- Anglers have quality fishing opportunities for a wide variety of cold water and warm water species, including trout, smallmouth bass, and sturgeon.

APPENDIX C: UPPER ST. CROIX MANAGEMENT COMMISSION POLICY RESOLUTION

MANAGEMENT POLICY RESOLUTION UPPER ST. CROIX MANAGEMENT COMMISSION

Adopted October 20, 1993

I. COMMISSION ESTABLISHMENT, COMPOSITION AND JURISDICTION

The Upper St. Croix Management Commission (hereinafter, "the Commission") was established effective October 29, 1971. The membership of the Commission shall consist of an appointed representative from each of the following organizations:

National Park Service (NPS)

Northern States Power Company (NSP)

Minnesota Department of Natural Resources (MDNR)

Wisconsin Department of Natural Resources (WDNR)

Minnesota-Wisconsin Boundary Area Commission (MWBAC),
an ex-officio, non-voting member.

The Commission shall annually elect a chair from among its members. The activities of the Commission shall be coordinated by the MWBAC, as mutually agreed upon by the Commission and the MWBAC. The jurisdiction of the Commission shall include those public lands and waters within the St. Croix National Riverway, as authorized in Section 16(a) of Public Law 90-542. Nothing in these guidelines shall supersede provisions of any easements within the Riverway.

II. COMMISSION OBJECTIVES

The objectives of the Commission shall be:

A. To bring together the aforementioned parties involved and concerned with the implementation of the 1969 St. Croix River Cooperative Agreement, the National Park Service St. Croix Riverway Master Plan, the Wisconsin Governor Knowles State Forest Management Plan and applicable county forest comprehensive plans, and the Minnesota Upper St. Croix Resource Management Plan.

B. To provide a regular forum for discussion of mutual problems, activities and programs associated with the St. Croix National Riverway.

C. To coordinate programs and plans of the parties so as to avoid duplications and conflicts with the Cooperative Agreement and State and Federal legislation.

D. To promote and ensure coordination with local units of government and other interests, including meetings on county forest comprehensive plans, and participation by Riverway private property owners and the general public.

E. To monitor implementation of programs and plans for consistency with the management objectives in the St. Croix National Riverway Master Plan.

F. To formulate uniform policies, insofar as possible, among the parties, recognizing their legislative and policy requirements.

NOW, THEREFORE, BE IT RESOLVED by the Upper St. Croix Management Commission that the following policy statements are adopted by the Commission to guide its members and others, as appropriate, in establishing and conducting management programs and reviewing development proposals within or affecting the St. Croix National Riverway:

III. POLICY STATEMENTS

A. General Resource Protection

1. The intent of Riverway management should relate back to the definition of a free-flowing river and the stated purpose of the Riverway - to maintain the Riverway in accordance with guidelines for its scenic and recreational classification areas.

2. Maintain the Riverway in its present state, or restore, where feasible, to near primitive conditions. Resource quality and visitor use conflicts should be carefully monitored on a regular basis to determine the extent to which visitor use regulations should be enacted to enhance visitor safety and enjoyment and to protect the rights of private Riverway landowners and the natural resources of the Riverway.

3. Trash cans should be provided at every vehicle access point. A vigorous "take out what you brought in" publicity campaign should be undertaken to eliminate littering.

4. Sanitation facilities will be installed at all designated camping locations.

5. Use of camp stoves should be encouraged at all primitive or riverside campsites.

6. Methods of encouraging visitor use during off-peak seasons should be studied and implemented.

7. Additional stabilization and rotation of primitive camping sites will be needed to prevent resource degradation. A camping permit system should be evaluated by the Commission, in consultation with local authorities, outfitters and users. Efforts should be directed toward resource protection and restoration and, where necessary, mitigation of resource impacts.

8. Manage the Riverway to provide a spectrum of outdoor recreational experiences, consistent with the classification and purpose of the Riverway.

9. Provide Riverway information for a national audience, while recognizing its strongly regional characteristics, emphasizing resource protection.

B. Water Surface Use

1. Visitor use monitoring should be conducted cooperatively by the managing agencies.

2. Federal, state and local authorities will take necessary steps to ensure enforcement of applicable regulations governing or affecting the development and protection of the St. Croix National Riverway, relating to water surface use.

3. Appropriate visitor use regulations should be jointly developed and adopted.

4. Law enforcement actions at all governmental levels should be coordinated to the extent possible, including common radio communications capabilities.

5. Any docks constructed by Use and Occupancy owners, remaining riparian owners, or within zoned areas of the Trego and Hayward Flowages, must be the minimum necessary to meet only the owner's needs, and be constructed only under permit from the Corps of Engineers after public notice. No docks should obstruct navigation. Docks or piers in Wisconsin waters should comply with WDNR Publication WZ-017, or permits may be required.

6. Non-riparian dockage and moorage outside of established marinas should not be allowed.

C. Water Quality

1. The States of Minnesota and Wisconsin have each generally classified the St. Croix River, and in the case of Wisconsin, the Namekagon River, as Outstanding Resource Waters, recognizing them as waters having the highest value as a resource.

2. The parties will use every available means to see to it that a Comprehensive St. Croix River Basin Water Quality Management Plan is developed and implemented, in order to improve existing water quality and to vigorously protect against further degradation, rather than to try to remedy problems after they develop. Any discharges to the waters of the St. Croix and

Namekagon Rivers must meet the non-degradation standards for Outstanding Resource Waters.

D. Development Standards

1. The number of designated river accesses should remain at approximately the present level. Access should provide for canoes and boats, where practicable, including well-spaced fishing accesses. Access ramp surfaces should be gravel or natural material, unless use patterns, accessibility or other maintenance needs dictate the need for asphalt or concrete. Parking for each access should be located out of sight of the river; optimum parking should be for 10 to 20 vehicles. Accesses should provide for outfitter and private trailer turning and parking.

2. Only public safety, informational, directional or location signs shall be visible from the water. Signs may be used to identify state park, state forest or county forest boundaries, landings, access points or primitive campsites.

3. With the exception of those marking state park, state forest or county forest boundaries and for public safety, signs within sight of the river shall follow NPS sign standards and shall be built by the NPS. Replacement signs shall be through the NPS.

4. No structures, other than those built specifically to serve the Riverway and public utilities, shall be allowed within 150 feet of the river.

5. Agencies should ensure that plans or applications for permits for any public or private development project within the Riverway boundaries are reviewed by the Commission.

6. Rebuilding existing electric power line crossings within existing rights-of-way wherever possible is a Riverway management goal. If a line is determined by the owning utility to no longer be needed, the line should be removed, as should lines formerly serving dwellings which no longer exist.

7. Power line corridors which were reserved by NSP should be utilized to the fullest extent possible for all utilities. No other new utility corridors are considered necessary within the Riverway.

8. Activities necessary for the safe and reliable operation and maintenance of public utilities will be allowed, except that selective vegetative cutting practices will be exercised within the federal Riverway boundary or visibility zone, as determined in consultation with appropriate Riverway management agencies.

9. When any new bridge structure is built across the Riverway, the old structure should be removed to riverbed level.

E. Endangered and Threatened Species

1. Efforts should be undertaken to coordinate identification and monitoring of the endangered and threatened species, both Federal- and State-listed, within the Riverway.

2. Only native vegetation shall be planted along or within the Riverway corridor. Within the corridor, to the extent

possible, no exotic or non-native animal species shall knowingly be stocked by any managing agencies or other parties.

3. When considering crossings of the Riverway with bridges or utilities, agencies should ensure that no endangered or threatened species are impacted.

F. Zoning and Zoned Areas Along the Namekagon River

1. Existing non-public launching ramps, including those that are open to the public but charge a fee, should not expand their parking capacity. New non-public launching ramps should not be encouraged within the Trego and Hayward Flowages.

2. Local units of government are strongly urged to restrict parking adjacent to all launch ramps, public and private, on lands under their jurisdiction.

3. Shoreline development within the zoned areas of Hayward and Trego Flowages should be reviewed on a periodic basis to ensure that the intent of the Riverway is being carried out. The enactment of more restrictive zoning standards may be required if development becomes overly intrusive.

APPENDIX D: SUMMARY OF NATURAL RESOURCES MANAGEMENT ACTIONS

The management actions are listed in order of priority as listed in the 1995 NPS *Resources Management Plan*. This plan is updated frequently and should be

consulted as actions are completed and priorities change.

Table D-1: Summary of Natural Resource Management Actions Identified in the St. Croix National Scenic Riverway *Resources Management Plan* (in priority order) (NPS 1995c)

-
- Develop geographic information system (GIS) base maps and provide program support
 - Continue zebra mussel management actions (i.e., public information/education, inspections and access management, establish watercraft treatment centers, monitor, conduct research)
 - Investigate threats to water quality and develop a basin water resources management plan
 - Monitor mussel populations' abundance and distributions
 - Obtain aerial photography of the riverway
 - Develop a campsite management plan
 - Monitor the effects of cranberry operations on the river, and in particular on water quality
 - Protect listed aquatic species
 - Evaluate sediment transport and resulting pollution of the riverway
 - Evaluate the status of federal and state threatened and endangered species
 - Monitor and control purple loosestrife
 - Assess soil erosion and develop a soil erosion management plan
 - Survey the status of federally and state listed plant species
 - Evaluate and monitor campsite sanitary facilities
 - Develop vegetation maps
 - Develop soils maps
 - Develop a vegetation integrated pest management (IPM) plan
 - Evaluate stream morphology and benthic habitats
 - Evaluate flow regime impacts of the riverway's hydroelectric dams
 - Provide for fish and fish habitat management
 - Delineate and map wetlands
 - Refine the index of biotic integrity (IBI) for the Namekagon fishery
 - Restore remnant prairies
 - Prepare and implement a prescribed fire management plan
 - Develop restoration plans for disturbed sites (e.g., use and occupancy cabins)
 - Document the distribution and ecology of riparian mammals
 - Survey and map spotted knapweed
 - Conduct a forest insect and disease assessment
 - Evaluate fragmented habitats of the riverway landscape and the responses of resident bird species
 - Develop a hazard tree management plan
 - Survey listed waterbirds
 - Evaluate the status of listed raptors
 - Map and monitor beaver activity
 - Analyze historic and present land use patterns along the riverway
 - Survey and measure salt influx from roads
 - Monitor habitat use by neotropical migratory birds
 - Develop a comprehensive trail plan
 - Inventory the riverway's old growth biological communities
 - Conduct a visitor use/perceptions study
 - Survey land snail population
 - Survey fungi of the St. Croix Valley
 - Monitor air quality and visibility

- Evaluate Lyme disease exposure and risks in the riverway
- Determine the extent and character of habitat modifications to the Namekagon River
- Monitor for gypsy moth populations
- Survey herptofauna distributions

APPENDIX E: MORE DETAIL ON THE VERP PROCESS

To identify indicators and standards for visitor experiences, a baseline visitor profile is needed, both riverwide and by management area. Data should be collected on use patterns, describing how much use different reaches of the river receive and on what riverway users define are acceptable and unacceptable experiences. Random sampling for these visitor surveys would be stratified by season (i.e., spring, summer, and fall), management area, and weekday/weekend. (At this time winter uses would not be studied due to the relatively low levels of winter use.) The results of these surveys should enable the riverway managers to select workable social indicators and specify standards by management area.

Natural resource indicators and standards also must be identified. The scientific literature should be reviewed for possible indicators and standards used in similar habitat types. Alternatively, original research may need to be conducted in the riverway to identify indicators, comparing examples of visitor impacts and relatively unimpacted areas for river ecosystems like the Upper St. Croix and Namekagon Rivers. The riverway managers would then set standards for each of the selected resource indicators.

Once the initial resource and visitor experience indicators and standards have been selected, monitoring plans would need to be developed. The indicators, standards, and monitoring techniques then would be tested over a season. Field testing would might result in the alteration, addition, or elimination of some indicators, standards, or measurement techniques.

When the above tasks have been completed, and after appropriate public involvement, a VERP implementation plan would be developed, which tiers off this general management plan. This implementation plan would describe and refine the indicators that are being monitored in each management area, the standards, and the monitoring effort. The National Park Service's carrying capacity framework then would be fully implemented, meaning that there would be continued monitoring and evaluation of visitor use levels, facilities, and resources, and continuing adjustment, if necessary, of visitor use levels and facilities. After field testing is completed and the implementation plan is published, changes to the standards could only be made by amending the general management plan.

IDENTIFYING STANDARDS AND INDICATORS

Each management area has characteristics that distinguish it from the other management areas, but for the most part these are general statements. More research is needed to identify appropriate indicators and standards, differentiate between management areas, and then develop a monitoring program. This research would determine which indicators would best measure different management area characteristics (e.g., encounters per hour/day/weekend, structures visible per half-mile/mile/day, and square feet/yard of soil compaction per camping site). When the measurable indicators are determined, then standards are set that define the minimum acceptable conditions in the management areas (e.g., in the near-primitive northwoods management area no more than 5/25/75 encounters per hour/day/weekend 90%/95% of all summer weekends/weekdays; no more than 2/10/40 structures visible per half mile/mile/day; and no more than 10/30 square feet/yards of compacted soil per camping site measured at the end of the summer season). Such specificity was never intended to be part of the general management plan and can only be accomplished through future research . (NOTE: The numbers above are for illustration only and are not based on any scientific data.)

ACTIONS TAKEN BECAUSE OF EXCEEDED STANDARDS

When conditions are approaching the unacceptable level, action needs to be taken. It would then be up to the riverway staff to select and implement corrective measures. It may be necessary to try various corrective methods before determining which might be the most effective solution, and not in all cases will the same method be the best solution. An example of this scenario might go as follows. Research determines that when the barren soil surrounding a single primitive campsite exceeds 48 square yards at the end of the camping season the situation has reached an unacceptable level of resource damage. Based on the site-specific conditions and the extent of the problem: several possible management actions may be taken, such as closing the campsite to prevent further resource damage, adding additional campsites in the area to accommodate the demand and reduce impacts at this particular site, or limiting the number of individuals per camping party to reduce site-specific impacts. There may need to be some field testing of promising management strategies to determine which one(s) should be implemented on the upper riverway.

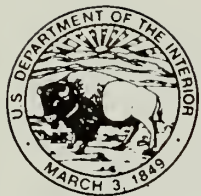
APPENDIX F: ST. CROIX NATIONAL SCENIC RIVERWAY PROPOSED INCREASED STAFFING

		Alternative 1 (Preferred)	Alternative 2
Interpretation			
Trego	Ranger, GS-9 (P)	\$35,260	\$35,260
	Ranger, GS-4 (S)	8,135	8,135
Marsh- land	Ranger, GS-7 (S)	11,270	11,270
	Visitor Use Assistant, GS-4 (P)	8,500	8,500
Head- quarters	Ranger, GS-9 (P)	35,260	35,260
	Extend seasonal season	6,618	6,618
	Information Receptionist, GS-4 (P) Convert to Full-Time	2,500	2,500
	Operational Increase	55,000	55,000
	Resource Manager (Cultural), GS-11 (P)	50,222	NA
	Ranger, GS-5 (S)	9,100	NA
	Publications	10,000	NA
Resource Management			
	Res. Management Spec. GS-11 (2) (P)	100,444	100,444
	Bio. Tech., GS-4 (4) (S)	32,540	32,540
	Planner, GS-11 (P)	50,222	50,222
	Operational Increase	213,000	213,000
Visitor Protection			
Trego	Ranger, GS-9 (P)	\$41,513	\$41,513
	Ranger, GS-7 (2)(S)	22,540	22,540
Marsh- land	Ranger, GS-9 (2)(P)	83,026	83,026
	Ranger, GS-7 (2)(S)	22,540	22,540
Head- quarters	Ranger, GS-7 (S)	11,270	11,270
	Operational Increase	143,000	143,000
	Park Ranger, (fee collection) (1.5) (S)	NA	39,639
	Cash Clerks, GS-3 (S)	NA	14,492
	Operational Increase	NA	7,800

		Alternative 1 (Preferred)	Alternative 2
Administration			
	Computer Specialist, GS-11(P)	50,222	50,222
	Operational Increase	15,000	15,000
Maintenance			
Trego	Upgrade WS-6 to WS-7	1,480	1,480
	Upgrade WG-7 to WG-8	8,515	8,515
	Upgrade WG-5 to WG-7	2,200	2,200
	Maintenance Worker, WG-5 (2) (S)	26,114	26,114
Marsh- land	Maintenance Worker, WG-5 (2) (S)	26,114	26,114
	Youth Conservation Corps (5)	14,000	14,000
	Maintenance Worker, WG-5 (S)	NA	13,057
Head- quarters	Landscape Architect, GS-7 (P)	44,013	44,013
	Operational Increase	120,500	120,500
Total Increase in Funding		\$1,260,118	\$1,265,784

Note: P = Permanent employment and S = Seasonal employment

APPENDIX G: LETTER FROM U.S. FISH AND WILDLIFE SERVICE



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Twin Cities Field Office

4101 East 80th Street

Bloomington, Minnesota 55425-1665

JUN 12 1997

Memorandum

To: Regional Director, Midwest Region, National Park Service

From: Field Supervisor, Twin Cities Field Office *Lynn M. Lewis*

Subject: Continued informal consultation on the General Management Plan/Environmental Assessment for the St. Croix National Scenic Riverway and the Cooperative Management Plan/Environmental Impact Statement for the Lower St. Croix National Scenic Riverway, Wisconsin and Minnesota

This responds to your April 1, 1997, memo requesting an updated list of federally listed species and species of concern that could be potentially affected by the General Management Plan/Environmental Assessment for the St. Croix National Scenic Riverway and the Cooperative Management Plan/Environmental Impact Statement for the Lower St. Croix National Scenic River, Wisconsin and Minnesota. We are providing the lists separated out by the two plans and counties. Note the lynx (Lynx canadensis), is newly listed as a candidate species. Thus, it is not protected by Federal law, but must be addressed during any planning initiatives.

The following is a list of Federal species located in the National Scenic Riverway area:

Wisconsin

Bayfield County

<u>Classification</u>	<u>Common Name (Scientific Name)</u>	<u>Habitat</u>
endangered	gray wolf (<u>Canis lupus</u>)	northern forest areas
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding
threatened	Fassett's locoweed (<u>Oxytropis campestris chartacea</u>)	open sandy lakeshores
candidate	lynx (<u>Lynx canadensis</u>)	northern forest areas

APPENDIXES

Burnett County

endangered	gray wolf (<u>Canis lupus</u>)	northern forest areas
endangered	Karner blue butterfly (<u>Lycaedis melissa samuelis</u>)	prairie, oak savanna, and jack pine w/wild lupine
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/ wintering

Douglas County

endangered	gray wolf (<u>Canis lupus</u>)	northern forest areas
endangered	Kirtland's warbler (<u>Dendroica kirtlandii</u>)	potential breeding in jack pine
endangered	pipin plover (<u>Charadrius melodus</u>)	sandy beaches; bare alluvial and dredge spoil islands
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding

Polk County

endangered	peregrine falcon (<u>Falco peregrinus</u>)	potential breeding
endangered	Karner blue butterfly (<u>Lycaeides melissa samuelis</u>)	prairie, oak savanna and jack pine w/wild lupine
endangered	Higgins eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix River
endangered	winged maple leaf mussel (<u>Quadrula fragosa</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/ wintering

Sawyer County

endangered	gray wolf (<u>Canis lupus</u>)	northern forest areas
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding
candidate	lynx (<u>Lynx canadensis</u>)	northern forest areas

Washburn County

endangered	gray wolf (<u>Canis lupus</u>)	northern forest areas
endangered	Kirtland's warbler (<u>Dendroica kirtlandii</u>)	potential breeding in jack pine
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/wintering

MinnesotaChisago County

endangered	Higgins' eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix R.
endangered	winged maple leaf mussel (<u>Quadrula fragosa</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding
species of concern	Blanding's turtle (<u>Emydoidea blandingii</u>)	
species of concern	lake sturgeon (<u>Acipenser fulvescens</u>)	St. Croix R.
species of concern	crystal darter (<u>Ammocrypta asperella</u>)	St. Croix R.
species of concern	blue sucker (<u>Cycleptus elongatus</u>)	St. Croix R.
species of concern	salamander mussel (<u>Simpsonia ambigua</u>)	St. Croix R.
species of concern	spectacle case pearly mussel (<u>Cumberlandia monodonta</u>)	St. Croix R.
species of concern pools/	bog bluegrass (<u>Poa paludigina</u>)	shallow escarpments

Pine County

threatened	gray wolf (<u>Canis lupus</u>)	peripheral
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding

The following is an updated list of federally listed species, candidate species, and species of concern that could be potentially affected by the Cooperative Management Plan/Environmental Assessment for the Lower St. Croix National Scenic Riverway, Wisconsin and Minnesota:

WisconsinPierce County

endangered	peregrine falcon (<u>Falco peregrinus</u>)	breeding
endangered	Higgins' eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/ wintering

Polk County

endangered	peregrine falcon (<u>Falco peregrinus</u>)	breeding
endangered	Higgins' eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix R.
endangered	winged maple leaf mussel (<u>Quadrula fragosa</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/ wintering

St. Croix County

endangered	peregrine falcon (<u>Falco peregrinus</u>)	potential breeding
endangered	Karner blue butterfly (<u>Lycaedis melissa samuelis</u>)	prairie, oak savanna and jack pine w/wild lupine
endangered	Higgins' eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/ wintering

MinnesotaChisago County

endangered	Higgins' eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix R.
endangered	winged maple leaf mussel (<u>Quadrula fragosa</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding
species of concern	Blanding's turtle (<u>Emydoidea blandingii</u>)	
species of concern	lake sturgeon (<u>Acipenser fulvescens</u>)	St. Croix R.
species of concern	crystal darter (<u>Ammocrypta asperella</u>)	St. Croix R.
species of concern	blue sucker (<u>Cycleptus elongatus</u>)	St. Croix R.
species of concern	salamander mussel (<u>Simpsonia ambigua</u>)	St. Croix R.
species of concern	spectacle case pearly mussel (<u>Cumberlandia monodonta</u>)	St. Croix R.
species of concern pools/	bog bluegrass (<u>Poa paludigina</u>)	shallow escarpments

Washington County

endangered	peregrine falcon (<u>Falco peregrinus</u>)	breeding
endangered	Higgins' eye pearly mussel (<u>Lampsilis higginsii</u>)	St. Croix R.
threatened	bald eagle (<u>Haliaeetus leucocephalus</u>)	breeding/ wintering
species of concern	plains spotted skunk (<u>Spilogale putoris interrupta</u>)	
species of concern	migrant loggerhead shrike (<u>Lanius ludovicianus migrans</u>)	breeding
species of concern	cerulean warbler (<u>Dendroica cerulea</u>)	breeding
species of concern	Blanding's turtle (<u>Emydoidea blandingii</u>)	
species of concern	false map turtle (<u>Graptemys pseudogeographica</u>)	
species of concern	lake sturgeon (<u>Acipenser fulvescens</u>)	St. Croix R.

APPENDIXES

species of concern	crystal darter (<u>Ammocrypta asperella</u>)	St. Croix R.
species of concern	blue sucker (<u>Cycleptus elongatus</u>)	St. Croix R.
species of concern	elktoe mussel (<u>Alasmidonta marginata</u>)	St. Croix R.
species of concern	salamander mussel (<u>Simpsonaias ambigua</u>)	St. Croix R.
species of concern	spectacle case pearly mussel (<u>Cumberlandia monodonta</u>)	St. Croix R.
species of concern	elusive clubtail dragonfly (<u>Gomphus notatus</u>)	St. Croix R. watershed
species of concern	St. Croix snaketail dragonfly (<u>Ophiogomphus susbecha</u>)	St. Croix R. watershed
species of concern	extra-striped snaketail dragonfly (<u>Ophiogomphus anomalis</u>)	St. Croix R. watershed
species of concern	Sylvan hygrotus diving beetle (<u>Hygrotus sylvanus</u>)	St. Croix R. watershed
species of concern	Hill's thistle (<u>Cirsium hillii</u>)	prairies, savannas, open woods
species of concern	butternut (<u>Juglans cinerea</u>)	mesic hardwood forests
species of concern	bog bluegrass (<u>Poa paludigina</u>)	shallow pools/ escarpments

According to the Green Bay Field Office, there is good information available within Wisconsin on mammals, birds, herptiles, and fish. The following list of species occurs in the Wisconsin counties of the St. Croix National Scenic Riverway. Information about insects and plants is less reliable, so those species have been deleted. The Service has virtually no information available regarding the occurrences of these species within Wisconsin counties, mostly due to issues regarding confidentiality.

SPECIES OF CONCERN KNOWN FROM THE COUNTIES OF THE ST. CROIX NATIONAL SCENIC RIVERWAY

	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
MAMMALS		
	Canada Lynx	<u>Lynx canadensis</u>
BIRDS		
	Black Tern	<u>Chlidonias niger</u>
	Cerulean Warbler	<u>Dendroica cerulea</u>
	Henslow's Sparrow	<u>Ammodramus henslowii</u>
	Loggerhead Shrike	<u>Lanius ludovicianus</u>
	Northern Goshawk	<u>Accipiter gentilis</u>
REPTILES		
	Blanding's Turtle	<u>Emydoidea blandingii</u>
FISH		
	Blue Sucker	<u>Cycleptus elongatus</u>
	Greater Redhorse	<u>Moxostoma valenciennesi</u>
	Lake Sturgeon	<u>Acipenser fulvescens</u>
MUSSELS		
	Elktoe	<u>Alismodonta marginata</u>
	Salamander Mussel	<u>Simpsonaias ambigua</u>
INSECTS		
	St. Croix Snaketail Dragonfly	<u>Ophiogomphus susbehcha</u>
	Tawny Crescent Butterfly	<u>Phyciodes batesii</u>
PLANTS		
	Lake Cress	<u>Armoracia aquatica</u>
	Algae Leaved Pondweed	<u>Potamogeton confervoides</u>

Bog Bluegrass

Poa paludigena

Butternut

Juglans cinerea

Hill's Thistle

Cirsium hillii

Goblin Fern

Botrychium mormo

BIBLIOGRAPHY

- Boyle, T. P., N. J. Hoefs, and D. R. Beeson
1992 "An Evaluation of the Status of Benthic Macroinvertebrate Communities in the Saint Croix National Scenic Riverway, Minnesota and Wisconsin." Internal report for the Water Resources Division, National Park Service. On file at riverway headquarters, St. Croix Falls, WI.
- Bray, E.C.
1977 *Billions of Years in Minnesota. The Geologic Story of the State.* Science Museum of Minnesota, St. Paul, MN.
- Bureau of the Census, Department of Commerce
1992 *Census of Population and Housing: Summary, Minnesota and Wisconsin.* On CD-ROM tape file 3. Washington
- Bureau of Economic Analysis, U.S. Department of Commerce
1995 *Regional Economic Information System* (CD ROM), Washington, D.C. Regional Economic Measurement Unit, 1994 data.
- Curtis, J. T.
1971 *The Vegetation of Wisconsin. An Ordination of Plant Communities.* University of Wisconsin Press, Madison, WI.
- Dickas, A.B.
1986 "Comparative Precambrian Stratigraphy and Structure Along the Midcontinent Rift." *American Association of Petroleum Geologists (AAPG) Bulletin* 70(3): 225-38.
- Doolittle, T. C. J.
1988 *Distribution and Relative Abundance of Freshwater Mussels in the Saint Croix National Scenic Riverway.* Cable Natural History Museum, Sigurd Olson Environmental Institute, Ashland, WI.
- Fago, D. and J. Hatch
1993 "Aquatic Resources of the Saint Croix River Basin." in *Proceedings of the Symposium on Restoration Planning for the Rivers of the Mississippi River Ecosystem*, edited by L. W. Hesse, C. B. Stalnaker, N. G. Benson, and J. R. Zuboy. Biological Report 19. National Biological Survey, Washington, D.C.
- Forest Service, U.S. Department of Agriculture
1986 *Land and Resource Management Plan, Chequamegon Nation Forest.*
- 1995 *Descriptions of the Ecoregions of the United States*, compiled by R.G. Bailey. Miscellaneous Publication #1391. 2nd edition. Washington, D.C.
- Glenn-Lewin, D.C., T. R. Rosburg, and J. M. Ver Hoef
1992 *A Survey of the Wetlands of the Saint Croix National Scenic Riverway, Wisconsin and Minnesota, From Stillwater to the Headwaters of the Saint Croix and Namekagon Rivers.* Prepared for the National Park Service (#PX6590-7-0137). Department of Botany, Iowa State University, Ames, IA. On file at the riverway headquarters, St. Croix Falls, WI.
- Heath, D.J. and P.W. Rasmussen
1990 *Results of Base-Line Sampling of Freshwater Mussel Communities for Long-Term Monitoring of the Saint Croix National Scenic Riverway, Minnesota and Wisconsin.* Wisconsin Department of Natural Resources, Madison, WI.
- Jackson, Hartley H. T.
1961 *Mammals of Wisconsin.* University of Wisconsin Press: Madison, WI.
- Judziewicz, E.J.
1994 *Final Report: Inventory and Monitoring of Rare Vascular Plants, St. Croix National Scenic Riverway, Minnesota and Wisconsin.* Department of Botany, University of Wisconsin, Madison, WI.
- Kuska, J. J., J. S. Edstrom and M. H. Smithberg
1974 *Saint Croix - Namekagon River Resource Inventory.* Miscellaneous Report 122-1974. Agricultural Experiment Station, University of Minnesota. St Paul, MN. On file at riverway headquarters, St. Croix Falls, WI.
- Kuss, F. R., A. R. Graefe, J. J. Vaske
1990 *Visitor Impact Management, Vol I: A Review of Research.* National Parks and Conservation Association: Washington.

BIBLIOGRAPHY

- Minnesota Department of Natural Resources, Natural Heritage Program
1975 *Upper St. Croix Resource Management Plan*.
- 1993 *Minnesota's Native Vegetation. A Key to Natural Communities*. Version 1.5. St. Paul, MN.
- 1995a *Minnesota's Saint Croix River Valley and Anoka Sandplain. A Guide to Native Habitats*, by D. S. Wovcha, B. C. Delaney, and G. E. Nordquist. Minnesota County Biological Survey, Minnesota Department of Natural Resources. University of MN Press. Minneapolis, MN.
- 1995b *State Park System Five-year Interpretive Services Plan*. St. Paul, MN.
- Minnesota-Wisconsin Boundary Area Commission
1994 *Stewardship of the Lower Saint Croix River and its Watershed*. Final project report. Hudson, WI.
- National Park Service, U.S. Department of the Interior
1976a *Final Environmental Impact Statement, Master Plan, Saint Croix National Scenic Riverway*. Prepared by the NPS Midwest Regional Office and the Minnesota and Wisconsin Departments of Natural Resources. On file at riverway headquarters, St. Croix Falls, WI.
- 1976b *Final Master Plan. Saint Croix National Scenic Riverway*. On file riverway headquarters, St. Croix Falls, WI.
- 1984 *Land Protection Plan*. Copy on file at riverway headquarters, St. Croix Falls, WI.
- 1985 *Problem Exotic Plants in Selected Parks of the Midwest Region and a Bibliography on Their Management*. Prepared by Karen E. Pestana. Research/Resources Management Report MWR-6. Contract No. PX6000-5-0248. Omaha, NE.
- 1990 *Saint Croix National Scenic Riverway River Access Sites Wayside Exhibit Plan*. Harpers Ferry Center Division of Wayside Exhibits. Copy available at riverway headquarters, St. Croix Falls, WI.
- 1991 *Statement for Management*. Copy on file at riverway headquarters, St. Croix Falls, WI.
- 1995a *Interpretive Prospectus: A Plan for the Interpretation of Saint Croix National Scenic Riverway*. Harpers Ferry Center Division of Interpretive Planning. Copy available at riverway headquarters, St. Croix Falls, WI.
- 1995b "Baseline Water Quality Data, Inventory and Analysis Saint Croix National Scenic Riverway." Internal report by the Water Resources Division and Servicewide Inventory and Monitoring Program. Three volumes. On file at riverway headquarters, St. Croix Falls, WI.
- 1995c *Resources Management Plan. St Croix and Lower Saint Croix National Scenic Riverway*. On file at the riverway headquarters, St. Croix Falls, WI.
- 1997 *Water Resources Management Plan. St. Croix National Scenic Riverway. Minnesota and Wisconsin*. On file at the riverway headquarters, St. Croix Falls, WI.
- In process
The Visitor Experience and Resource Protection (VERP) Framework: A Handbook for Planners and Managers. Denver Service Center, Denver, CO.
- Richardson, Dr. James W.
nd "Preliminary Survey of Plant Communities and Endangered Species of the St. Croix National Scenic Riverway." University of Wisconsin, River Falls. River Falls, WI.
- Smith, William A.
1995a *Status and Distribution of Ophiogomphus Dragonflies in Wisconsin*. Report submitted to the U.S. Fish and Wildlife Service per Cooperative Agreement No. 14-16-003-89-933. Natural Heritage Inventory Program, Bureau of Endangered Species, Wisconsin Department of Natural Resources, Madison, WI.
- 1995b *Status and Distribution of Stylurus Dragonflies in Wisconsin*. Report submitted to the U.S. Fish and Wildlife Service per Cooperative Agreement No. 14-16-003-89-933. Natural Heritage Inventory Program, Bureau of Endangered Species, Wisconsin

- Department of Natural Resources, Madison, WI.
- Soil Conservation Service, U.S. Department of Agriculture
- 1995 *Soil Survey of Chisago County, Minnesota*. In cooperation with the Minnesota Agricultural Experiment Station.
- U.S. Fish and Wildlife Service, Department of the Interior
- 1979 *Classification of Wetlands and Deepwater Habitats of the United States*, by L. M. Cowardin, V. Carter, F. C. Golet, and E.T. LaRoe. FWS/OBS-79/31. Office of Biological Services, Washington, D.C.
- 1981 *Birds of the Saint Croix River Valley: Minnesota and Wisconsin*, by C.A. Fannes. North American Fauna, Number 73. Government Printing Office, Washington, D.C.
- U.S. Geological Survey, Department of the Interior
- 1982 *Saint Croix National Scenic Riverway, Wisconsin -- Floodplain Delineation and Water-Quality Data* by C.L. Lawrence. Administrative Report. Progress Report No. 6. On file at riverway headquarters, St. Croix Falls, WI.
- 1986 *Water Quality in the Saint Croix National Scenic Riverway, Wisconsin*, by D. J. Graczyk. Water Resources Investigations Report 85-4319. Madison, WI.
- 1994 *Water Resources Data. Minnesota. Water Year 1993. Volume 2. Upper Mississippi and Missouri River Basins*, by G.B. Milton, J. H. Hess, and K.G. Guttormson. Prepared in cooperation with the Minnesota Department of Natural Resources, the Minnesota Department of Transportation, and other state, municipal and federal agencies. Data Report MN-93-2. On file at riverway headquarters, St. Croix Falls, WI.
- 1996 "Long-term Water Quality Monitoring — Saint Croix National Scenic Riverway." Progress report and scope of work proposal. Unpublished report. USGS, Mounds View, MN.
- U.S. West, Optical Publishing
- 1987 Hydrodata CD ROM, published by U.S. West, Optical Publishing 1987.
- Warren, S., T.R. Crow, and J. R. Probst
- 1993 *Terrestrial Habitat Analysis*. University of Minnesota and USDA Forest Service North Central Experimental Station, Rhinelander, WI. LCMR Work Element B.7. Minnesota-Wisconsin Boundary Area Commission, Hudson, WI.
- Waters, T.F.
- 1977 *The Streams and Rivers of Minnesota*, University of Minnesota Press. Minneapolis, MN.
- Wetmore, C.M.
- 1991 *Lichens and Air Quality in Saint Croix National Scenic Riverway. Final Report*. Prepared for the National Park Service (contract USDI/PX6590-8-0179 and PX6000-0-031) by the Univ. of Minnesota, St. Paul, MN. On file at riverway headquarters, St. Croix Falls, WI.
- Wisconsin Department of Natural Resources
- 1986 *Distribution and Relative Abundance of Fishes in Wisconsin: VII. St. Croix River Basin* by Don Fago. Technical Bulletin No. 159. Madison, WI.
- 1988 *Governor Knowles State Forest Master Plan*. Natural Resources Board.
- 1994 *The Saint Croix River Water Quality Management Plan: A Five-Year Plan to Protect and Enhance Our Water Resources*. PUBL-WR-270-94-REV. Madison, WI.

PREPARERS AND CONSULTANTS

PLANNING TEAM

DENVER SERVICE CENTER

Project Manager — John Hoesterey
Job Captain/Landscape Architect — Nola Chavez
Cultural Resource Specialist — Tom Thomas
Natural Resource Specialist — Michael Rees
Resource Economist — Richard Lichtkoppler
Interpretive Planner — Keith Morgan

ST. CROIX NATIONAL SCENIC RIVERWAY

Superintendent — Tony Andersen
Chief of Interpretation — John Daugherty
Chief of Resource Management and Visitor
Protection — Brian Adams
Administrative Officer — Jan Gauthier
Water Resources — Randy Ferrin
Namekagon District Ranger (retired) — Arnie Long
Marshland District Ranger — Ron Aldorf

MIDWEST REGION

Landscape Architect/Park Planner — Mark Weekley

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Division of Waters — Steve Johnson
Park Manager — Wild River State Park —
Chuck Kartak
Regional Administrator — Bob Hance
Trails and Waterways Unit — Kevin Arends

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Forestry Staff Specialist — Chuck Adams
Rivers Specialist — Dave O'Malley
Forest Specialist — Mike Giles

MINNESOTA-WISCONSIN BOUNDARY AREA COMMISSION

Technical Advisor — Eric Macbeth

NORTHERN STATES POWER COMPANY

Environmental Analyst and Planning Coordinator —
Pam Rassmussen

UNIVERSITY OF MINNESOTA, COOPERATIVE PARK STUDIES UNIT

Senior Research Associate and Cooperative Park
Study Unit Social Science Program Leader —
Dave Lime

MINNESOTA STATE HISTORIC PRESERVATION OFFICER

Dennis Gimmestad

WISCONSIN STATE HISTORIC PRESERVATION OFFICER

Jeff Gyrisco

CONSULTANTS

DENVER SERVICE CENTER

Landscape Architecture Quality Leader — Carol
Whipple

Planning — Joel Kussman
Planning — Richard Alesch
Purpose and Significance — Marilyn Hof
Facilitation — Jan Harris
Planning Technician — Carrie Maldonado
GIS Specialist — Brian Carlstrom
Planning Student Volunteer — Lance Hansen
Visual Information Specialist — Judy Dersch
Editing — Christy Fischer and Jon Nickolas
Cartographic Technician — Steve Franklin

ST. CROIX NATIONAL SCENIC RIVERWAY

GIS/Technician — Marrianna Young
Resource Management Specialist — Sue Jennings
Biological Science Technician — Ann Hebig

MIDWEST REGION

Deputy Regional Director — David Given
Assistant Regional Director for Planning,
Legislation, and WASO Coordination —
Al Hutchings
Chief of Planning and Environmental Quality — Dean
Alexander

WASHINGTON OFFICE

Park Protection and Planning — John Haubert

MINNESOTA-WISCONSIN BOUNDARY AREA COMMISSION

Lower St. Croix Management Commission
Coordinator — Jim Harrison
Administrative Director — Dan McGuiness

ST. CROIX CHIPPEWA INDIANS OF WISCONSIN

Community Planner — Richard Hartmann

GREAT LAKES FISH AND WILDLIFE INDIAN COMMISSION

Wildlife Biologist — Peter David





As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

